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THE CAUSES AND TREATMENT OF ARTERIAL HYPERTENSION.*

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Physiology of the Circulation

Among the wonderful mechanisms of the human machine not the least remarkable is that by which the circulation of the blood is maintained under the varying demands made upon it day by day. The main business of the circulation takes place of course, in the capillaries of the lungs and of the tissues. This capillary bed in the aggregate is much the widest portion of the vascular stream. Here the blood flows more slowly and time is afforded for those exchanges between blood and tissues or blood and the air in the lungs upon which the nourishment of our bodies and life itself depend.

For the maintenance of this capillary flow there is an unusually efficient system of pump and pipe lines in the heart, the arteries, the arterioles, the capillaries themselves and the veins. The regular and rhythmical beats of the heart force the blood into and through the arterial system. The elasticity of the large vessels stores up some of the energy of the heart beat and with the aid of the contractility of the smooth muscle in the arterial wall helps in the propulsion of the blood. The maintenance of a certain degree of contraction of the musculature of the small arterioles (tonicity) offers some resistance to the passage of the blood stream and determines to a certain extent the amount of blood and the rapidity of its flow through any given capillary area. Since the pipe lines of this circulation are not rigid tubes but vitally elastic and muscular ones, it follows that the pressures in the different parts of the circulatory apparatus are not the same. The pressure is quite high in the ventricles during their contraction and in the large arteries next the heart. It gradually diminishes as the individual arteries become smaller and the blood stream as a whole becomes wider: it is considerably lower in the capillaries than in the small arteries and lowest of all in the veins where the blood flow is rapid but under slight pressure.

After the ventricular contraction a wave of increased pressure passes along the arterial tree in the form of the pulse and the pressure at the height of the pulse wave is spoken of as the systolic pressure. Owing to the nature of the arterial walls and the resistance offered by the tonicity of the small arterioles, a fairly high minimal pressure is constantly maintained in the arterial system between the pulse waves and this minimal pressure we speak of as the diastolic pressure. The increase of pressure with each pulse wave or the difference between diastolic and systolic pressure we call the pulse pressure. The pulse reaches even the smallest arteries but disappears in the capillaries where the flow is practically steady and continuous. The term, blood pressure, may refer to the tension anywhere in the vascular bed but among the laity and even in ordinary medical parlance it usually refers to the arterial pressure and particularly to the pressure in the brachial artery where it is routinely measured.

Factors Regulating Arterial Pressure.—Not only is the arterial pressure different in arteries of different sizes but it varies many times a day in the same artery, depending upon the demands made by the body for more or less flow of blood. Recent studies have shown that the arterial pressure is very much less during sleep than during periods of rest in the waking hours and we know, too, that during active exercise the presssure is much higher than when the body is at rest. Some of the factors by which the arterial pressure is normally maintained and varied according to different states of bodily activity are (1) the force and rapidity of the heart beat, (2) the elasticity of the arterial walls, (3) the viscosity of the blood, (4) the blood volume,

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and (5) the contractility of the small arteries. Under uniform conditions these factors maintain the arterial pressure at a fairly constant level. There seems to be a particularly delicate adjustment between the degree of tone of the small arterioles and the heart action and from the rapidity with which the reciprocal mechanism acts it would seem that the correlation of their activities must occur through the autonomic nervous system. This view is strengthened by the well known influence of emotional and other psychic factors upon the heart beat and upon the arterial pressure, as well as by the results of animal experimentation.

Autonomic Nervous System.—The consideration of the autonomic nervous system or even of that portion having to do particularly with the circulation, namely, the vasomotor nerves, occupies an important chapter in physiology. We are taught that there are special vasoconstrictor nerve fibres kept in a continuously tonic state of activity by a vasoconstrictor centre in the medulla, that there are efferent vasodilator fibres and in addition afferent pressor fibres that tend to stimulate the vasoconstrictor centre and afferent depressor fibres that tend to depress its activities. A similar nervous mechanism aids in controlling the heart's action. Through a thousand reflexes as well as by psychic and emotional factors the different parts of the circulation are coordinated and changes in pressure and in blood flow are brought about.

Chemical Substances.—But in addition to reflex, psychic and emotional factors, other influences may play upon the autonomic nervous system including the vasomotor system. There are chemical substances in the circulating blood, chemical messengers or hormones, that have a special affinity for the autonomic nerves. There are other substances, drugs of one sort or another, that when injected into the blood stream exert pressor or depressor effects. There may be substances derived from the food that behave similarly or substances elaborated during the normal metabolic activities of the body. Such chemical materials in the circulating blood may act upon the vasoconstrictor centre, upon the nerve endings in the vessel walls or even upon the smooth muscle itself.

Pathological Physiology—Hypertension

I have cited in review some of the familiar facts about the circulation in health in order that we may have in mind the different factors to be considered in abnormal states as well as to emphasize the complexities that we must face in a study of the pathological physiology of the circulation.

Types of Arterial Hypertension.—By far the most important pathological states of arterial tension are those of hypertension by reason of their frequency and the complications with which they are associated in the minds of physicians and of laymen alike. The dividing line between the normal and the abnormal is not sharply defined but we are apt to consider abnormal any systolic reading over 145 or 150 and any diastolic reading over 90. Among the many different methods of classifying cases with arterial hypertension we may choose arbitrarily for purposes of discussion the following:

1. Arterial hypertension associated with acute nephritis.
2. Arterial hypertension associated with chronic nephritis.
3. Arterial hypertension with demonstrable arteriosclerosis.
4. Arterial hypertension without demonstrable lesions in kidneys or in arteries.

We need not stop to describe cases in all these groups with which we are all familiar. We will probably all agree that arterial hypertension may be due to an acute nephritis although in the first acute phase the blood pressure may be a relatively insignificant feature. Similarly, we probably all believe that chronic nephritis resulting from repeated acute infections of the kidneys may bring about extreme grades of arterial hypertension.

To us by far the most interesting group is the fourth, in which the high pressure is not associated with any demonstrable organic lesion. This form has been variously designated "essential hypertension", "hyperpiesis", and "hypertensive cardiovascular disease", and is widely accepted as a functional condition due to a hypertonic state of the smooth muscle of the arterioles. What causes this arterial hypertonicity is thus far unknown but is the subject of active speculation and of experimental endeavor. The condition may be discovered during a routine examination for life insurance, in the examination undertaken for some unrelated complaint or there may be symptoms like dizziness, increased frequency of headache, palpitation, fatiguability or mild

dyspnoea that lead the patients to seek advice. The pathological process may progress rapidly, it may show a gradual increase year after year or it may remain stationary for long periods. It may occasionally even disappear entirely if some fortunate change is made in the patient's life habits and activities. But if a patient with essential hypertension is followed, it will usually be found that sooner or later arterial changes become manifest, albumin and casts appear in the urine, the heart shows evidence of the strain to which it has been subjected and there may ensue one or more of the ultimate complications, namely, heart failure, renal insufficiency and apoplexy. The case that was originally placed in Group 4 has now become indistinguishable from cases in Groups 2 and 3, and there are evidences that lead many of us to believe that the majority of cases in the 2nd and 3rd groups were originally of the 4th group, or, in other words, that the majority of cases of arterial hypertension begin as functional disturbances that lead gradually or quickly to organic disease.

Causes of Disease

In searching for causes of chronic arterial hypertension by examining the data at our disposal, let us keep in mind the fact that very few pathological lesions are referable to a single cause. Even with an infectious disease whose extraneous exciting cause is definitely recognized, there are other predisposing etiological factors that determine the susceptibility of the patient, the time, the manner, the extent, the severity of the infection. Physicians have always recognized the existence of predisposing causes. They have noted so frequently that of four children exposed to scarlet fever only one may become ill, that of two inveterate drunkards, one may die of cirrhosis of the liver and the other of delirium tremens, that several members of one family may commit suicide during a period of mental depression while no such happening occurs in another family living under the same conditions. There is here the suggestion of inherent differences in men themselves as well as in their surroundings. But although such facts are of common knowledge, scientific medicine for many decades up until recently paid scant attention to anything except the extraneous causes of disease.

The present century, however, has seen a change in the trend of biological research and this change is beginning to be reflected in medical thought. In the latter half of the 19th century biologists were chiefly occupied in the study of the origin of species from which grew the doctrine of evolution. During the past few decades they have been especially interested in the origin of the individual by the study of heredity and of development. Such studies have made great strides particularly in reference to the lower forms of animal and plant life. The studies of man's development and especially the determination of the relative importance of factors of heredity and of factors of environment are much more difficult by reason of his slow breeding, his polyhybrid nature and his relative inaccessibility to experiment. But there are many reasons to believe that the principles of heredity that have been carefully worked out for lower forms of life are broadly applicable to man and that a scientific basis for the study of the constitution and for predisposition to disease has been established. In the work of Julius Bauer of Vienna, of a number of German psychiatrists, of George Draper, in New York, and of Raymond Pearl and of Wertheimer, in Baltimore, we see the beginnings of such studies.

We know that man like any other animal begins by the union of two sex cells or germ cells, each of which contributes an equal number of chromosomes in which, we believe, the inheritance factors reside. These two cells, fused to form a single cell (zygote), start a new individual that in a suitable environment subdivides into two cells, then into four and then gradually into many millions of cells with differentiation into the various organs and tissues. The individual develops stage by stage to complete adulthood and in the successive stages we have to deal with two sets of factors: (1) those of the germ plasm derived from the father and mother (factors of heredity) and (2) those of the surroundings of the developing being (factors of environment). The heredity of the individual determines the *possibilities* of his development; the surroundings during development are decisive as to the possibilities that attain to *realization*. Both sets of factors are, of course, necessary for the development of an individual. A hundred years ago the greatest emphasis was placed upon the importance of environment, and many of our institutions of today—social, political, religious—are based upon the assumption that all men are created equal and that the differences in men are due to the influences

by which they have been surrounded. Now the pendulum has swung in the opposite direction and biologists are convinced of the overwhelming importance of heredity for the development of the lower forms of life and of its relatively great importance for the development of man. They recognize that the environmental factors are of greater importance in man than in the lower forms of life, by reason of man's longer period of helpless immaturity during which he is most susceptible to the play of environmental influences, by reason of his greater possibilities of development and of his more varied environment.

Hereditary Factors.—Are diseases inherited? In answering this question we should remember that no developed characters are inherited as such, but that our germ plasm may contain the determiners of abnormal traits as well as of normal traits and if the environmental factors are suitable for the development of the abnormal trait, disease may result. Hence we must keep in mind these two sets of factors, especially in the consideration of chronic disease.

What evidence is there that inheritance factors are of importance in the occurrence of arterial hypertension? (1) The fact that certain families may contain several members who develop arterial hypertension relatively early; (2) certain physical and mental traits that are so characteristic of such families and that are so often found in the victims of hypertension. We are all familiar with the stocky build, short thick neck, red face, and tendency to obesity that make up the physical type often spoken of as the habitus apoplecticus, and with the mental characteristics frequently associated with it, namely, the tenseness, the tendency to worry, the over-seriousness, the concentration, the narrowing of interests, the inability to play, traits which often lead to success in business or profession. (3) The frequency of hypertension in victims of migraine, an exquisitely hereditary disorder, usually associated with labile vasomotor nervous systems. (4) The repeated demonstrations by actuarial and statistical methods, so well brought out by Pearl in his little volume called "The Biology of Death", that the duration of life in man is largely determined by his inherited physico-chemical make-up and the experiments on lower animals indicating that longevity is a trait that behaves exactly like a Mendelian character in inheritance studies. If heredity is of such importance for the duration of life, it would seem to be equally so in the determination of the chronic diseases that bring life to an end. At present we may only state these impressions somewhat vaguely, that constitutional inferiorities of the vascular, the nervous, the endocrine and the metabolic systems play an important role in the pathogenesis of arterial hypertension. Later we may learn more of the details by which such tendencies are mediated.

Environmental Factors.—What of the environmental factors of importance in the development of hypertension? Naturally these demand our particular attention for, however great or small the emphasis placed upon innate characters, it is in the study of environmental influences that we may hope to find a more satisfactory and more definite basis for causal therapy and for prophylaxis than we have today. Analyses of the histories of hypertensive patients point toward certain types of factors, that may be roughly grouped as: (1) hygienic faults that increase the wear and tear of life on either the mental or the physical side (over-work, anxiety, worry, excitement, social dissipation, excesses of various sorts); (2) infectious processes (recurring tonsillitis, scarlet fever, typhoid fever, oral sepsis, influenza) that may serve to increase the wear and tear or may perhaps exert some more direct effect upon the structures involved; (3) chronic intoxications of exogenous or endogenous origin (lead poisoning, chronic alcoholism, excessive use of tobacco, over-indulgence in food, chronic constipation); (4) any external influences that may favor endocrine disturbances and metabolic faults (particularly, thyroid dysfunction, the menopause, obesity, diabetes, and gout). There are naturally differences of opinion among physicians as to the relative importance of these several agents. Quite probably different ones are operative in different cases and it is possible that some day we may learn of a common basis of action behind them all. Will it be a neurogenic basis? or a physico-chemical one, or a combination of the two? When we realize the intricacies of physical chemistry, as seen, for example, in the fact that two substances each differing from its isomer only in its behavior toward polarized light may have entirely different pharmacological effects, and, further, the still greater intricacies of physiological chemistry, we may appreciate the difficulties

of research workers and the magnitude of the work undertaken. The comparatively simple chemical mechanism by which the respiratory centre in the medulla seems to be regulated, namely, the variation in carbon dioxide tension of the blood, lends hope that some similar regulatory factor for the vasoconstrictor centre may also be found.

Treatment of Patients With Arterial Hypertension.

A Thorough Study.—The therapeutic plan for patients with hypertension or other chronic ailments should, we believe, follow and be based upon a thorough diagnostic study, by which we endeavor to recognize all discoverable deviations from normal structure and function, to inquire into their possible internal and external causes and to acquire as full a knowledge as is practicable of the physical, psychic and social status of the patient. When the study in a case of chronic arterial hypertension is completed and the diagnostic summary made, we may outline the therapeutic plan with due attention to the several essential features disclosed by the study. There may be needed changes in diet; in the general hygiene of work, play, rest, exercise, baths and care of the excretory functions; the correction of easily remediable defects like the superficial focal infections; psychotherapy; and the necessary symptomatic therapy. All the way through one should mix common sense liberally with one's therapeutic fervor, avoid asking the impossible; attempt to win the confidence of the patient and to secure his whole-hearted cooperation.

Diet.—It is not our custom to limit the diet excessively in these cases. In the absence of renal or myocardial insufficiency there is no conclusive evidence that the hypertensive patient does not handle an ordinary diet satisfactorily. If obesity is present the diet is designed toward a reduction in weight and, if constipation exists, it is arranged with this factor in mind. Since most of us eat more protein than is necessary we do advise that the protein intake be smaller than in the usual diet, preferably not more than the equivalent of 10 per cent of the total caloric value of the food. Salt and condiments may be reduced to the minimum for satisfactory palatability.

Hygiene.—As to general hygiene, in the first place, as many of these patients have been leading very strenuous lives, burning the candle at both ends, and perhaps also are highly nervous and worried about their condition, a thorough rest treatment of several weeks in bed is usually helpful. During this time other features of the therapeutic regimen may be carried out and the physician has an excellent opportunity to explain the situation to the patient, to calm his fears as far as possible, and to enlist his cooperation in the matter of diet and method of life which he should follow in the future. After an initial period when the blood pressure may be followed daily to note its spontaneous variations, it is well to pay less attention to this feature and to explain to the patient that a rise in his blood pressure is often a compensatory process that is beneficial in his circumstances and that the direct height of the blood pressure is far less important than the conditions that underlie it. After the rest period the vacation may be extended in some pleasant and preferably quiet resort before the patient is permitted to take up his routine duties again. It is usually unwise, we believe, to suggest that the patient give up his work, or that it be changed too radically, unless the type of work is entirely unsuited to his condition. Certain changes may often be made with great benefit and these must depend upon the individual study of each patient. An active lawyer, for example, may be persuaded to give up his court work that he has found to be exceedingly trying and to limit his work to the office; or a physician may be urged to give up general practice, to confine his work to office patients, or to accept some position which permits of a sedentary life. It may be suggested to the business man that he delegate the most unpleasant of his duties to others, that he spend the forenoons at his office, reserving the afternoons, or at least three or four of them each week, for rest and out-of-door relaxation. A rest, lying down for an hour after the midday meal, is a valuable provision in all such regimens, and a stipulation should be made that there shall be no work at night. Sometimes patients are advised to remain in bed on a simple milk diet for the last two days in each month, or even for one day of each week.

The matter of exercise is important. We believe that the hypertensive patients without myocardial or renal signs should be encouraged to take mild exercise out of doors daily, for observation has shown that they often do very much better under these circumstances. Golf

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in moderation, the milder forms of gardening, walking and motoring are well within his possibilities. It goes without saying that tennis, long hikes and mountain climbing, as well as all the more strenuous out-of-door sports, should be forbidden. It must be remembered that many of the hypertensive patients have never learned to play,—they have never had a hobby outside of their regular occupation. The development of such a hobby may be difficult, but is essential.

In the matter of baths, the hypertensive in good general condition may follow his usual habits in this regard. In the later stages of the disease the bath should preferably be tepid or slightly warm, and never should be extremely cold or extremely hot.

We prefer to regulate the intestinal functions by means of the diet, the drinking of a suitable amount of water, out-of-door exercise, regularity in habit and perhaps also fairly large doses of mineral oil, or the combination of mineral oil with agar. It may often be helpful to give an occasional saline laxative, say once a week.

Focal Infections.—We believe that focal infections should receive appropriate treatment. Definitely infected teeth should be extracted and their sockets curetted. Pyorrhea should have thorough treatment A significant prostatitis should be treated. The question of the removal of infected tonsils or the undertaking of other more serious operations must be determined in each individual case. Most patients in the earlier stages of hypertension stand operative procedures very well. We have found in some cases that those hypertensive states that accompany Graves' disease or that are found in association with thyroid adenomata can sometimes be benefited by a partial thyroidectomy.

Psychotherapy.—Almost all patients with arterial hypertension may be benefited by the use of psychotherapy properly conceived and tactfully and persistently presented. As Barker has said, "psychotherapy in the broad sense of dispelling fear, of inspiring confidence and hope, of educating the patient regarding the nature and course of his malady, of guiding him toward a more hygienic mode of life and of cultivating in him the ability to face the realities with serenity, will be found to be the most beneficently potent and serviceable agent that we possess." Among the laity there is much fear of high blood pressure, for the public, too, has learned that in the long run patients with high blood pressure die from uremia, from heart failure, from cerebral apoplexy or from terminal infections. But it is a mistake to allow patients in the early stages of hypertension to suffer too much from fear. Physicians now know that patients may manifest high blood pressure for many years and even for decades before any serious complications set it.

In arranging the patient's regimen and particularly in reference to psychotherapy it is highly desirable that the attitude of the patient's relatives and his daily associates receive some attention. While the thoughtful husband or wife, or business associate, may aid by timely suggestions in holding the careless patient to his prescribed course, it is most unfortunate to have over-anxious members of the family constantly reminding a patient of his high blood pressure and of the dangers to which he is subject. Such nagging does vastly more harm than good by keeping him in a state of mental unrest and perhaps by driving him to secret dissipation.

Symptomatic Therapy.—In the symptomatic treatment of hypertensive patients we make very little use of drugs designed especially for the reduction of the blood pressure. Iodine preparations, nitrites, benzylbenzoate, yohimbin have been much used by many physicians. In cases of hypertension associated with angina pectoris the nitrites are often really helpful, particularly a hypodermic tablet of nitroglycerin, 1/100 of a grain, held under the tongue until it dissolves.

Symptomatic therapy of single symptoms of which the hypertensive patient often complains may do much to make the patient more comfortable even in the more advanced stages. The insomnia, the headache, the dizziness, the feelings of nervousness and of apprehension, should receive attention. Some of these patients, as we have already noted, suffer from periodic attacks of migraine. These and other headaches should be relieved. Simple remedies may suffice, as, for example, a five grain tablet of aspirin, or a similar dose of pyramidon, or a combination of either of these with a grain or a grain and a half of caffein citrate. If the headache be very severe a quarter or a half grain of codein may be combined with the simpler remedies and is usually effective. It gives the patient a sense of comfort and of confidence to realize that he has a potent

remedy even for the distress of a severe migraine attack. Morphia is rarely if ever necessary for such headaches though it is often given and occasionally leads to drug addiction. For the more frequent and milder forms of headache and for the dizziness, the insomnia and the neurasthenic symptoms, moderate doses of luminal for short periods are very useful, say half grain tablets two or three times a day. Allonal is another useful drug of this type.

Prophylaxis

My remarks have been concerned chiefly with the so-called essential hypertensions or with the cases showing comparatively slight evidences of organic disease. In the later stages the heart, the kidneys and the arteries are the subjects of chief interest and concern, and each patient should receive the treatment appropriate to the situation.

If our summing up of the subject is correct or even approximately so, it is obvious that much more may be expected of prophylaxis than of cure. The physician who discovers in a patient an incipient hypertension, a familial predisposition, or potentially dangerous environmental features may, by suitably educating the patient and by instituting the proper regimen, do much toward limiting the progress of the disease and postponing its lamentable sequels.

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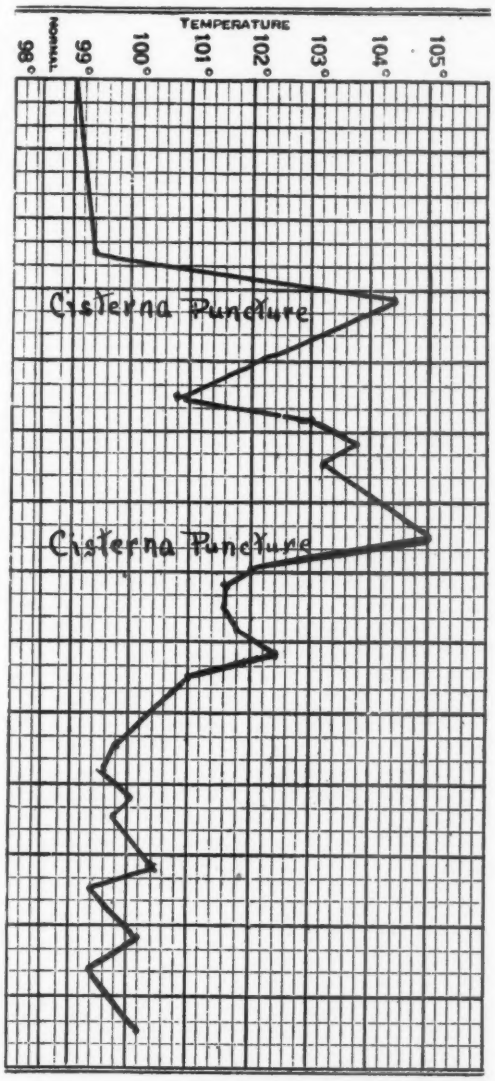
CISTERNA MAGNA PUNCTURE IN THE NEWBORN—REPORT OF THREE CASES.*

By M. PIERCE RUCKER, M. D., Richmond, Va.

Being born is a most hazardous undertaking for the human being, and by far the commonest pathology incident thereto is within the cranial cavity. The etiology of these conditions is not fully understood. Trauma undoubtedly plays an important role, but often the cases that received the most trauma escape and the ones that received the least show fatal hemorrhages. Siegert,[1] for instance, reports the case of placenta previa, with membranes unruptured and the cervix the size of a 5 mark piece, in which a Cesarean section was done. The child weighed 2900 gm. and was 52 cm. long. It was asphyxiated and did not breathe for twenty minutes and never had a strong cry. It died suddenly on the second day of heart weakness. Autopsy showed a bilateral tentorial tear and considerable intracranial bleeding. Asphyxia plays an important role in the production of intracranial hemorrhages as does also rapid delivery. I do not believe that we bear in mind often enough the effect of a quick change from the intra-uterine pressure of the second stage of labor to that of the atmosphere outside of the body. Finally, there is some experimental evidence[2] to show that



Temperature chart of Case III showing the relationship of the two cistern punctures to the temperature curve.

*Read before the Manchester Medical Society, February 7, 1928.

dietary errors on the part of the mother, especially a deficiency of vitamine B, is an etiological factor.

It would seem then that the obstetrician, no matter how skilful he may be, must frequently meet with cases of increased intracranial pressure. Sharpe,[3] with routine lumbar puncture in 5 series each of 100 newborn babies at the New York City Hospital, found a blood tinged spinal fluid in approximately 10 per cent of the cases. Infants that are hard to resuscitate and those that appear abnormal in the first few days of life nearly always have intracranial injury, so much so that Rivière[4] has reported resuscitating with spinal puncture asphyxiated babies that seemed hopeless with the usual methods.

The immediate results of intracranial injury are so grave and the late sequelae so pitiful that any method of diagnosis and treatment is to be welcomed. Dunham[5] reports 10 cases of intracranial injury of the newborn in which he did 27 cisterna punctures. The condition of these infants before the puncture is described as poor in one, critical in seven and moribund in two. In some he did a cisterna puncture after a dry spinal tap; in some the spinal tap was so bloody as to be inconclusive, and in some he did a cisterna puncture without first doing a lumbar puncture. Six patients recovered, and 5 of these were normal physically and mentally at the end of from 9 to 24 months.

My own experience with cisterna puncture in the living patient is limited to the following 3 cases:

Case I. The mother of this patient was a 24-year-old primigravida who was sent into the Sheltering Arms Hospital, in April, 1927, on account of toxemia of pregnancy. Her systolic blood pressure was 212, diastolic 108 m.m. of Hg. The urine contained many granular casts. The patient had three convulsions after entering the hospital and it was then that I saw her in consultation. The presentation was a frank breech, and the baby was delivered with forceps applied first to the breech and then to the after-coming head. The baby, a girl, weighed 3742 gm. (8¼ lbs.) and measured 54 c.m. (21¼ inches) total length. She breathed spontaneously, but in the next few days developed a shrill cry, and would not nurse. Lumbar puncture failed to get any fluid. The cisterna magna was then punctured and 10 c.c. of clear fluid were obtained. The fluid was under a pressure of 207 m.m. of spinal fluid. The baby's symptoms cleared up promptly and she left the hospital in excellent condition. Her doctor tells me that she died suddenly at the end of six weeks. Up until that time she had grown and behaved in a normal manner.

Case II. The mother of this patient was a multipara, 36 years old, who had a funnel pelvis, and who in her last month of pregnancy developed a toxemia, her blood pressure rising to 180/90. On this account labor was induced with a No. 5 Voorhees bag, on May 30, 1927, and the baby was delivered with low forceps. She weighed 3139 gm. (6 lbs. 14½ oz.) and measured 49 c.m. (19¼ inches). She needed no resuscitation and was apparently normal until the second day, when she developed convulsions. A dry spinal tap was done. Cisterna puncture gave a bloody fluid under considerable pressure. The convulsions ceased promptly. The subsequent history shows a normal development, and today she is the picture of health, physically and mentally.

Case III. This patient is the son of a primipara of 20 years. He was delivered October 20, 1927, with mid-forceps at the end of a 43 hour labor. He required no resuscitation but was slow in starting to breathe. He weighed 3685 gm. (8 lbs. 2 oz.) and was 55 c.m. (21½ inches) long. Within 24 hours the baby began to have convulsions and extreme opisthotonos. Spinal tap was dry. With a cisterna puncture 15 c.c. of clear fluid were obtained. It was apparently under considerable pressure. The opisthotonos and the convulsions disappeared for a few hours. The cisterna puncture was repeated the third day (October 23) and 10 c.c. of yellowish fluid obtained. The improvement following this was not so marked. The baby slowly improved, however, and by the time his mother left the hospital he was able to take the breast. His doctor tells me that now he is apparently a normal child.

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Medical Arts Building.

ACTINOMYCOSIS.*

By JAMES A. CAHILL, Jr., M. D., Washington, D. C.
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Actinomycosis may perhaps be defined best in the words of Wright[1] as a "suppurative process combined with granulation tissue formation". The pus contains the characteristic granules, or "Drusen", and is composed of dense aggregates of branched filamentous micro-organisms. The disease, "lumpy jaw," is known to be fairly common in cattle, and was first described by Le Blanc in 1826. Coller and Adie[2] have given a very complete historical resume of this disease in their studies at the University of Michigan. Their historical record shows that the characteristic granules were noted in a case of spinal caries in man by Van Langenbeck in 1845 and by Lebert in 1848, though the specific organism was not discovered until 1876 by Harz in granules found by Bollinger in cattle affected with the disease. The name of actinomycosis bovis was given to the organism by Harz. Prior to this time, in 1868, Rivalta had also made studies of the granules found in the lumpy jaw of cattle. Israel and Wolff, in 1878, isolated the organism from pus from empyema in man. Acland, in 1886, published records of the second case of infection in humans, and Nocard, two years later, described the first case of human actinomycosis in France.

The first cases of actinomycosis to be brought forth in America were those reported by John B. Murphy, of Chicago, in 1885. In 1899, Ruhrah published a collection of fifty-eight American cases, collected from all available sources. He added to this four cases in 1900, thus bringing the total to sixty-two cases. His thorough discussion of the subject bore fruit and shortly other cases were reported. Erving, in 1902, brought the literature to date and brought the total number up to 100 cases. Isolated case reports and articles dealing with its clinical aspects were not infrequent, and in 1921 Sanford and Magrath collected 119 cases from the literature and were able to add 96 cases of the disease observed in the Mayo Clinic. Since then, in 1923, Sanford, in studying the distribution of actinomycosis in the United States, collected a grand total of 678 cases from every available source. This number, he states, must represent only a comparatively small proportion of the number of individuals afflicted with the disease, as no doubt some of them escape diagnosis and a number are not reported. In his study of the distribution of the disease, he finds it quite prevalent in the upper Mississippi valley, but the actual distribution cannot be known until diagnosis is more common and a system of reporting is established. In this series we find a distribution throughout the states; no one section seemed immune. The important point would seem to be that, contrary to our previous ideas, the infection is not rare but is uncommon, and that, once we are on the lookout for it, more cases will be recognized than at present.

*Read before the District of Columbia Medical Society, January 12, 1927.

Etiology

The causative agent is the actinomyces bovis. The characteristics of this organism I will not describe, as our pathologists, Dr. Lester Newman and Dr. Oscar B. Hunter, will tell us a great deal more in detail. However, it will be of interest to note that this organism is found frequently on fragments of grain, but the usual mode of entrance is through carious teeth, breaks in the mucosa of the mouth caused by foreign bodies, and possibly through acute infection. The fact that some of the cases give a history of an acute onset, a period of quiescence followed by actinomycosis infection, would lend color to this later view. The disease is not contagious, being exceedingly difficult to produce the disease by injecting the infected pus into animals, and on account of its low virulence it would seem that a lowered resistance and natural susceptibility must be present. It is said to occur more frequently in men than in women, more often in the cities than in the country, though this is not altogether true of the many cases reported.

Occupations, such as farming, stevedoring and the corn husking industry are predisposing factors. The disease is most common between the ages of 20 and 40. The usual history in man is that of chewing particles of grass or the inhalation of grain dust which becomes lodged in abrasions of the mucous membrane of the alimentary canal or tonsillar crypt or through a carious tooth. It seems probable that the presence of a foreign particle

is necessary for the initiation, if not for the progress of the disease. Cases are reported by infection of dental instruments and splinters of wood.

Pathology

The pathology of this disease shows a destruction of all tissue invaded by the actinomyces bovis, with suppuration and the formation of large masses of granulation and connective tissue. It belongs to the group of infectious granulomata of which syphilis and tuberculosis are the most common of the group. In its invasion of tissue it does not follow the various planes of the body, but invades everything in its path. In this way it resembles a malignant growth. The amount of connective tissue found is often enormous.

Distribution of the Lesions: The fungus may attack any organ, but it shows a special tendency to spread in tissues of the connective-tissue type (areolar tissue, fibrous tissue, bones, and muscles). The commonest site in man is near the angle of the jaw; in cattle, in the tongue or jaw. Usually the disease first involves some part of the tongue, gastro-intestinal or respiratory tract, but primary cases have been observed in the skin and the genito-urinary organs, that is, in the kidney, prostate, and vagina. Secondarily, either by local spread or by metastasis, any tisssue or organ may become involved—pleura, peritoneum, bones, liver, and even brain.

Schlange recorded 100 cases, of which 80 were in the jaw and neck.

Morbid Anatomy: At the site of infection there is a chronic inflammatory process in which small round lymphocyte-like cells are usually seen. This area is soon surrounded by a firm fibro-cellular zone, and there ensues a gradual invasion of the neighboring connective-tissue planes, with hard lumpy masses of chronic inflammatory material. This may take the form of a general diffuse, brawny, infiltration with ill-defined edges, or of a definite collection of tumors which display at first a smooth, regular surface and a dense, uniform consistency. Secondary pyogenetic infection is a common and, in internal organs, an outstanding feature. The abscesses burst and discharge the characteristic granular and viscid exudate, so that eventually there remains a widespread and sinus-riddled diffuse mass of nodular infiltration, with a more or less profuse purulent discharge.

Microscopic Examination of a section shows a mycelium of radially arranged branching filaments lying in each softened area, and surrounded by a zone of fibro-cellular tissue. The sinus walls are lined by granulation tissue, which contains many "pepper granules." In the purulent contents of the abscesses, or in the discharge from the sinuses, the characteristic branching filaments are seen.

Colebrook suggests as a rough test that some suspected pus should be shaken vigorously in a test-tube with water; the ordinary pus elements are then broken up or emulsified; the actinomyces shreds, if present, are not fragmented, and are seen in holding the tube up to the light. They appear as cream-colored spherical bodies about ½—1 m.m. in diameter, which quickly sink to the bottom of the tube.

On slightly squeezing such a granule between a microscope slide and cover-glass and examining unstained under a low-power objective, the characteristic "ray" formation of clubs may be seen between an outer shell of massed leucocytes and the inner core of the granule. On crushing further and staining, the core is seen to be composed of a tangle of

A case of actinomycosis.

filaments, which retain Gram's stain rather irregularly. But, in spite of this statement, the examiner must not be disappointed if he fails to find "clubs"; actual definite "clubs" are not usual in human cases, the granule being merely an irregular mass of filaments.

Clinical Features

The *general symptoms* are often very vague unless an important organ be interfered with; so that, if the disease be in an internal part of the body, diagnosis may be difficult until the tumor becomes large and palpable, or until the fungus is found in the sputum of other ejecta. The victim presents slowly progressive weakness, anemia, and wasting, often allied with fevor of a tuberculous type, and, when questioned, may give a history of employment involving the handling of corn or the inhalation of grain-dust. There is no tenderness, and there may be no pain; when the latter exists, it is often neuralgic and due to pressure.

If the lesion is visible, the conditions described under morbid anatomy appear, namely, a diffuse tumefaction of a firm infiltrating type, nodular in places, in others softening and exuding the "pepper granules" in a viscid and sometimes watery medium. The overlying skin becomes mottled and purplish. True suppuration and lymphatic adenitis are absent unless secondary infection by pyogenetic organism has taken place.

The disease spreads by continuity, but occasionally invades a vein, and then may exhibit metastasis.

In Special Sites: 1. In the *head and neck*, which is by far the most common seat of the disease, the infection nearly always commences from a carious tooth or from an abrasion of the mucous membrane, as in the case to be reported. Thence it spreads to the lower jaw and cheek, though occasionally it may extend to the tongue, upper jaw, vertebral column, or even the base of the skull and brain. The disease pursues the course described above. Multiple abscesses, discharging a sticky exudate often containing "pepper granules," are formed in a mass of diffuse or nodular induration. Simultaneous cicatrization near the primary focus, spreading down the planes of the neck, occurs, until, perhaps, the disease finally reaches the mediastinum, leaving behind it a dense, fibrous track of distorted and nodular scar. It may extend from one side of the neck to the other. Stiffness of the neck and difficulty in swallowing and breathing may result. The great vessels are surrounded, but usually escape, though Ponfick, Schland, and others have recorded cases of erosion into the jugular veins and general metastatic actinomycotic pyemia.

If the disease enters at the angle of the mouth, it may lead to very extensive deformity.

2. *The Abdomen:* In the alimentary tract below the pharynx, primary cases have been reported in the esophagus by Mikulicz and others, but they are rare. Similarly, the stomach and small gut are relatively immune as compared with the large intestine. By far the greater proportion of gastro-intestinal cases occur in the region of the cecum, appendix, and ascending colon. The chief growth is in the submucosa, where it commences as flattened, greyish nodules. Owing to early secondary infection, softening and destruction are early and extensive. The peritoneum soon becomes involved. Dense adhesions form and become riddled by the disease, which thus, preceded by adhesions, spreads to all the surrounding structures and organs. It penetrates any variety of tissue, even bone, until it may ultimately reach the abdominal wall and perforate it, forming many fistulae. In like manner, the abscesses may burst into the bladder, kidney, or pleura. Fecal fistulae are not infrequent, but intestinal obstruction is a rare sequel.

Clinically, the signs are, at first, malnutrition and secondary anemia, sometimes irregular fever, and some intestinal catarrh, followed sooner or later by the discovery of a hard but ill-defined and usually painless tumor, which may show areas of semi-fluctuation. The cachexia becomes more marked, the irregular fever more constant, and, later, the lump may burst on the surface, usually in the cecal region, and discharge the ray fungus. A comparatively frequent occurrence is that appendectomy is performed for sub-acute appendicitis, the wound perhaps heals for a month or so, but then the patient returns with a mass in the ileo-cecal region, which is found to be actinomycotic; almost certainly the appendix was infected with the streptothrix from the beginning, but this fact was not recognized in the first instance. The liver is most frequently the seat of secondary deposits, which suppurate and give rise to irregular-shaped abscesses with walls of varying thickness. Local perihepatitis may occur.

3. *The Respiratory Tract:* Lung infection may sometimes be primary and due to inhalation, but more usually secondary by direct spread from disease in the neck, mediastinum, or abdomen. It manifests itself as a destructive broncho-pneumonia with peribronchial nodules and small, softened areas often com-

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bined with interstitial fibrosis. In a few cases the fibrosis is the predominant character. During this earlier stage, local physical signs are often wanting and the general symptoms indefinite.

The Diagnosis

The diagnosis is difficult in many cases. The classical picture of thick induration with discoloration and multiple sinuses give, of course, the evidence of a possible actinomycosis infection. The disease must be differentiated from old tuberculous lesions, Hodgkin's disease, sarcoma, lympho-sarcoma and gumma. The diagnosis will be made absolute by finding the small yellow sulphur granules in the purulent discharge from an incised abscess or open sinus.

Treatment

The treatment in this disease has been varied and with numerous drugs advocated. The administration of potassium iodide in large doses seems to be the drug of choice for administration by mouth. The operative treatment is simply that of opening the small sinus tracts and permitting the exit of the pus when it forms. Radium has been advocated for the disease, and Heyerdahl, the radiologist at Rik's Hospital, Oslo, Christiana, Norway, reports a most remarkable series of cures with radium. He states that he was the first to use radium in the treatment of this disease and that his early experience dates back to 1913. Since that date he has treated twenty-one cases, seventeen men and four women, all with a permanent cure and a good cosmetic effect and little scarring.

Good results are also obtained with X-ray.

Vaccines have also been used with various results reported. The best results are obtained in the lesions around the face and neck, as the lesions spread slowly.

Prognosis

The prognosis of abdominal and thoracic cases is grave and almost always fatal. The best treatment seems to be that of the combined surgical, medical and radiation. This method we will use on our patient, giving him large doses of potassium iodide and X-ray and, when the occasion indicates, opening the small sinuses to permit an exit for the pus. No radical operation is indicated.

I wish to report to the Society a very interesting case of actinomycosis. The patient, a negro, eighteen years of age, male, a street sweeper by occupation, entered Providence Hospital on November 2, 1926, complaining of a swelling of the right side of his face. He gave the following history:

Family history was negative. Previous history was negative except for the usual diseases of childhood, typhoid fever several years ago, and influenza in 1918. He stated that he had worked around horses and cattle three years ago while in the country. History of present illness dates back to August, 1926, when he first noticed a large swelling over the region of the right side of the face. The swelling extended back towards the ear and forward over the cheek. He went to Freedman's Hospital, where the condition was believed to be of an inflammatory character, and an incision was made to drain the probable abscess. No pus was obtained. Following this, he left Freedman's Hospital and his condition was unimproved. The swelling continued to increase and extended back toward the ear and downward, somewhat into the neck and up into the temporal region and caused some swelling of the right eye. Small areas would break down in certain points of the mass and discharge a sero-purulent exudate. He entered Providence Hospital, as was stated, on November 2, 1926, complaining of this swelling in the face, but stated that he had very little pain, though at times a dull ache was present. After the condition of actinomycosis was suspected, it was brought out in his history that, while doing his work as a street sweeper, he would often chew the straws of brooms with which he was working. Examination showed his face with a marked swelling over the right side involving the temporal region, the cheek, the posterior auricular and upper part of the neck above the mandible. The swelling was very hard and fibrous but there were some points of fluctuation. There was a draining sinus on the side of the head, posterior to the eye from which exuded a sero-purulent discharge. In this exudate could be seen small yellow granules and at times many could be expressed. The patient could not open his mouth as far as he normally could, but there was no trismus or involvement of the muscles of mastication. At times several sinuses were present, but there was never any breaking down of the entire mass. His temperature was practically normal, rising occasionally to 100. His chest, abdomen, extremities were all negative. X-ray of the mandible and bones of the

face showed no changes, although sometimes in these cases there are changes in the bones which show a honey-combing appearance in the radiograph. The Wassermann was negative. Blood examination was as follows: Haemoglobin—76 per cent; R. B. C.—3,940,000; W. B. C.—9,400. Examination of the discharge from the sinus showed several yellow sulphur granules and Dr. Newman reported numerous groups of gram-positive streptothrix. Examination of the fresh crushed preparations showed an occasional streptothrix actinomyces or ray fungus.

In considering the diagnosis of this case one

A case of actinomycosis.

had to rule out the possibility of sarcoma, lympho-sarcoma, tubercular lesions, gumma and some inflammatory condition. However, the history is important, which showed that he had chewed the broom straws from brooms which were used in cleaning the street, and this proved to be the causative factor in producing the disease.

The second factor which aided in the diagnosis was the history of the long standing swelling in the face. This, as you recall, dated from August, 1926, and an attempt had been made to operate upon an abscess which was not present.

The third important clinical evidence in this diagnosis was the gradual increase in the size of the swelling to its present "lumpy jaw" appearance.

Fourth, the laboratory findings made the diagnosis positive,—that is, the finding of the streptothrix actinomyces or ray fungus. Other factors, which were noted especially, were the absence of any persistent fever, lack of pain, apparent good health of the patient, negative Wassermann and practically normal blood findings. All of this data correlated made the diagnosis positive.

Summary

1. Actinomycosis is an uncommon disease in this location.

2. There are numerous cases reported, and it is more prevalent in the central states.

3. It should be suspected in any tumor in the region of the neck, face, abdomen or thorax which cannot be definitely diagnosed.

4. All chronic abscesses should be investigated for the ray fungus. The occurrence of any undue amount of blood following any incision and drainage of an abscess should make one suspicious.

5. Internal lesions of the thorax and abdomen prove fatal. Those of the face and neck are amenable to treatment.

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THE SURGICAL MANAGEMENT OF GOITER.*

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Introduction.

The success attained by competent surgeons of today in the management of goiter is the result of two factors: a better understanding of the principles underlying diseases of the thyroid and a more perfected surgical technic. It is not the object of this paper to glorify the surgical technic involved but rather to consider some of the fundamental principles underlying the surgical management of goiter.

History.

According to Da Costa, the term goiter is

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used to denote an enlargement of the thyroid gland not due to a malignant tumor or to inflammation. Among the diseases described by Hippocrates, goiter was not included. Juvenal and Pliny, however, did refer to it, the former in commenting on its frequency among certain Alpine tribes and the latter in stating that certain water wells seemed to disseminate the disease. It was early recognized that the enlargement might affect any portion of the gland or the entire gland and that the enlargement might be diffuse or nodular. Sporadic and endemic forms were differentiated in the fourteenth century and observers finally realized that goiter was sometimes responsible for certain systemic symptoms.

Exophthalmic goiter was first described as an entity in 1825 by Parry, who reported eight cases. Later, Graves, in 1835, and von Basedow, in 1840, described the clinical picture. That the disease might be cured by operation on the thyroid was discovered by Tillaux, Rehn, and Mikulicz. Surgery has made great progress since that time and the development and standardization of the operative technic resulted from the efforts of such men as Mikulicz, Billroth, Kocher, Halstead, C. H. Mayo, and Crile.

But the mastery of the details of operative technic was not sufficient. In spite of accurate and careful surgical procedures, sufficient in themselves in the treatment of simple goiter without thyrotoxicosis, the patient with thyrotoxicosis frequently succumbed to postoperative hyperthyroid crisis. The prevention of such accidents and the general advance in the surgical management of goiter was due mainly to improved classification of thyroid disease and a better understanding of the underlying physiologic and pathologic principles. Of inestimable value were the classification of goiter by Plummer, the discovery of thyroxin by Kendall, the recognition of the use of iodine in goiter by Marine, Plummer and others, the contributions made by various observers to the pathology of the thyroid and the insistence of Crile that goiter patients have complete physical and psychic rest.

Classification.

Plummer's classification of goiter has a functional basis and was arrived at through the careful observation of large numbers of goitrous patients seen at the Mayo Clinic. He was impressed with the fact that there seemed to be certain distinct clinical types of goiter.

The simplest was the diffusely enlarged thyroid of adolescence, the colloid goiter. The next was a nodular type, seen usually in adult life, the so-called adenomatous goiter. Often such glands had been present for many years without causing any obvious systemic symptoms. Such glands he classified as adenomatous goiter without hyperthyroidism. Over a period of years, these goiters exhibited a definite tendency toward hyperfunction and so he distinguished the adenomatous goiter with hyperthyroidism. The hyperfunction of such glands was characterized by the same symptoms as those produced by the administration of thyroxin, the active principle of the normal thyroid and therefore the symptoms seemed to be those of simple hyperthyroidism.

There were, however, certain other patients who exhibited a different symptom complex of hyperthyroidism than that due to the administration of thyroxin. Their symptoms were not merely those of a whipped-up metabolism, but were characterized by mental irritability and emotional instability. Some degree of exophthalmos usually occurred in these patients and therefore the disease was called exophthalmic goiter. This type of goiter occurred oftenest in early adult life and developed rapidly. The thyroid usually showed diffuse enlargement.

Physiology and Pathology.

Some insight into the mechanism of goiter may be had by the consideration of the physiology of the normal and the diseased gland. In 1914 Kendall discovered the molecule of thyroxin, the active principle of the thyroid. Later work seems to indicate that thyroxin acts as a chemical catalyst. It is estimated that the normal thyroid secretes about 0.5 mg. of thyroxin daily and that there are about 14 mg. in the tissues of an ordinary man. The administration of 1 mg. of thyroxin causes an increase of about 2.5 per cent in the basal metabolic rate. Kendall found that the thyroxin molecule contained 65 per cent by weight of iodine. Seaweed ash was used in the treatment of goiter as early as 1170. That iodine was the active principle was discovered by Coindet (Switzerland) in 1820. In 1850 Chatin (France) showed that the administra-

tion of iodine would prevent endemic goiter and cretinism. Marine, in 1918, demonstrated the use of iodine in preventing goiter in school children of goitrous districts. Plummer, in 1922, initiated the use of iodine in treating exophthalmic goiter at the Mayo Clinic.

Plummer evolved an hypothesis to explain the development of goiter. He believes that the colloid goiter of the cretin and the adolescent is a gland storing colloid because of over-stimulation and handicapped by a lack of iodine. Administration of iodine will prevent but not reduce such goiters. Administration of desiccated thyroid or thyroxin gives rest to the over-stimulated gland and allows the colloid to be absorbed. Complete rest is necessary for the treatment of this condition and since it is just on the border-line of hyperthyroidism such treatment should be carefully regulated by the clinical picture and frequent studies of the basal metabolic rate.

The so-called adenomatous goiter represents another reaction of the thyroid to over-stimulation and the lack of iodine. It contains masses of new acini, which have arisen through a demand on the gland for greater activity. This gland tends to grow and sometimes in the third or fourth decades of life, but most often in the fifth decade, causes hyperthyroidism. The average time between the initial appearance of the goiter and the development of hyperthyroidism is about seventeen and a half years. Since these goiters are often present for some time before they are recognized, the average time is more probably from twenty to twenty-five years.

Hyperthyroidism is due to an increase in the production of thyroxin and probably results from over-stimulation in the presence of a sufficiency of iodine. It presents a typical clinical picture which includes: a feeling of warmth, an increased appetite, a loss in weight, a fast pulse, and sweating. The pulse pressure is elevated because of the response of the heart to the increase in the amount of work demanded. Occasionally this slows the pulse. The patient may eat so much that he will gain weight for a time. Atypical manifestations are often due to fatigue of the organism under the increased stress. The heart and stomach may show early evidence of this, the heart by decompensation, the stomach by anorexia, and so forth. Preceding the period of fatigue there is often one of stimulation to such a degree that the patient may feel unusually well.

Differentiation between hyperthyroidism and essential hypertension is sometimes difficult. In a questionable case when the basal metabolic rate is doubtful, it is usually found that in the presence of a nodular thyroid, the symptoms are due to hyperthyroidism and in the absence of a nodular thyroid, they are more likely due to hypertension. In this connection the diastolic pressure is significant. If it is below ninety or one hundred millimeters of mercury, one may suspect hyperthyroidism, but if it is above, hypertension.

Exophthalmic goiter is probably due to over-stimulation of the gland capable of reacting, causing hypertrophy first and then hyperplasia. The first stage, rarely seen clinically before iodine came into use, is probably that of simple hyperthyroidism. This quickly passes into the stage in which the hard driven gland is crippled, proliferates, and produces an incomplete secretion which, according to Plummer's hypothesis, is thyroxin, which lacks an iodine radical. This hypothesis is substantiated by the clinical picture of the disease before and after the administration of iodine, which rapidly changes the syndrome from one of exophthalmic goiter to one of simple hyperthyroidism.

The outstanding features in the picture of exophthalmic goiter are nervous and ocular. The nervous phenomena are psychic, belonging largely to the subconscious mind. They often resemble the early symptoms of alcoholic intoxication. The ocular phenomena are first a stare and then frank exophthalmos, though certain cases of exophthalmic goiter do not have exophthalmos. There is marked mental irritability and emotional instability. The patient unconsciously poses and often goes through a series of useful but purposeless movements. He is quite unaware of his peculiar mental state. The neurotic individual makes excuses for his idiosyncrasies, but the one suffering from exophthalmic goiter does not lack assurance, and usually denies anything unusual in his behavior.

Since the introduction of iodine in the treatment of exophthalmic goiter, the surgical mortality at the Mayo Clinic has fallen from about 3 per cent to 0.6 per cent, and the mortality in non-operative cases is practically zero. The occasional death may be ascribed

not infrequently to some other intercurrent disease to which these patients are as susceptible as others. Many clinics elsewhere have reported similar success with iodine. The most satisfactory preparation of iodine is Lugol's solution (5 per cent aqueous solution of iodine with 10 per cent potassium iodide), administered by mouth, well diluted with water.

The pathologist has contributed rather accurate information concerning the structure of the various types of goiter. The colloid goiter is characterized by alveoli distended with colloid material. The nodular, so-called adenomatous goiter contains numbers of new acini and there are usually some accompanying degenerative changes of various degrees and types. The exophthalmic goiter shows diffuse hypertrophy and hyperplasia with papillary epithelial projections into the acini which contain little or no colloid. Following the administration of iodine the gland of exophthalmic goiter undergoes marked changes which are similar to the less marked changes of such glands during the natural remissions of the disease. The acini fill with colloid material and the gland becomes much firmer to the touch. It may actually increase in size. The iodine may well serve two functions: first, that of enabling the thyroid to proliferate a normal iodine-saturated thyroxin molecule, and second, that of so distending the gland with colloid as partially to block the smaller blood vessels and lymphatics, thus preventing the liberation of thyroxin in the body. These hypotheses are supported by the change in the clinical syndrome and the rapid and marked decrease in the basal metabolic rate following the administration of Lugol's solution. It is important to remember, however, that Lugol's solution will not cure exophthalmic goiter.

Hertzler, in a recent study of 1,000 cases of goiter, attempted to correlate the laboratory observations with the life histories of patients among whom he had lived for a generation. His method was somewhat similar to that of Sir James Mackenzie, who followed the lives of patients with cardiac disease. Hertzler concluded that the various forms of goiter are successive stages of a continuous disease process. Colloid goiter is the simplest type and is found in the young. Slow, irregular involutional changes with proliferation and degeneration cause the formation of the nodular goiter of adults. It is not strictly adenomatous. Such a gland eventually causes a more or less severe chronic toxemia or hyperthyroid state in later adult life. More rapid involutional changes with more active prolifieration cause the more diffusely enlarged gland and a more acute toxemia characteristic of exophthalmic goiter and found in early adult life. Rienhoff and Lewis and Thomas working independently, arrived at conclusions rather similar to those of Hertzler and stated that only about 8 per cent of so-called adenomatous goiters showed true benign neoplastic adenomata. The remaining 92 per cent might better be called nodular goiters. The irregular proliferative and degenerative processes with the consequent nodulation of the gland probably parallel closely the exacerbation and remission of symptoms so characteristic of goiter.

The conception of various types of goiter as components of a single disease would explain the apparent difference of opinion concerning the use of iodine. Iodine is especially efficacious in cases of exophthalmic goiter, but many advocate its use in cases of nodular goiter with hyperthyroidism as well. There are undoubted cases where simple hyperthyroidism and exophthalmic goiter occur in the same patient simultaneously and the administration of iodine induces definite improvement. The co-existence of these two forms or stages may be much commoner than generally believed, and hence the improvement in cases of supposed simple hyperthyroidism following the administration of Lugol's solution. Furthermore, the diagnostic criteria in distinguishing exophthalmic goiter from simple hyperthyroidism must be constant for various observers to compare results.

Surgery.

There are certain things which are of importance to the success of surgical treatment of goiter in general. Pemberton in a recent paper considered three especially: the establishment of the patient's confidence, the selection of anesthesia, and the avoidance of technical complications. The patient's confidence may be gained by outlining to him the general plan of management. He must be relieved of apprehension and given both phy-

sical and psychic rest. The importance of rest has been very strikingly shown by Crile.

The anesthesia of choice is local if the cooperation of the patient can be secured. Where supplementary general anesthesia is necessary the experience of the anethetist is probably the most important factor in choosing between nitrous oxide, ethylene, and ether. Whichever is used, deep and prolonged anesthesia should be avoided.

Partial thyroidectomy is the usual surgical procedure for goiter. In most cases part of each lobe is removed and sufficient thyroid tissue is left about the trachea to assure protection to the recurrent laryngeal nerves and the parathyroids. In this connection routine pre-operative examination of the larynx for possible cord paralysis is very important. The superior and inferior thyroid vessels are accurately ligated, preferably as soon as the lobe is exposed. Exposure is usually more satisfactory if the muscles are severed. During the entire procedure hemostasis must be accurate, ligation of large pedicles avoided, and trauma minimized. These measures will prevent the occurrence of injury to the recurrent laryngeal nerves and post-operative hemorrhage which Pemberton considers the most frequent technical complications.

In addition to the measures necessary to the successful surgical management of all goiters certain special measures are necessary in handling goiters with hyperthyroidism, especially those with exophthalmic toxemia. The supposed simple hyperthyroid case should be given Lugol's solution probably if there is any suspicion that an exophthalmic element may exist. The case with a frank exophthalmic syndrome should be prepared for operation very carefully.

Guthrie states that every such patient should have a private room and a special nurse. Pemberton stresses three essentials in treatment: iodine, rest, and a high caloric diet. About ten minims of Lugol's solution three times daily is given to the mild cases and proportional amounts, by rectum, if necessary, to the severer cases. As much as 100 minims may be given in twenty-four hours. Patients should be allowed to be up and around at least part of the day for several days before operation. The rest rather than digitalis is depended on to relieve the decompensated heart.

The proper time for operation is decided by experience rather than by rule of thumb. Preparation may often continue as long as there is improvement as evidenced by the clinical picture and studies of the basal metabolic rate. Care must be exercised that the patient does not pass the period of greatest improvement, and lapse into the state in which Lugol's solution is no longer efficacious. Lugol's solution is a pre-operative aid, but not a cure for exophthalmic goiter! Only a few days of preparation may suffice in mild cases, but a month or more may be necessary in severe cases. General strength must be built up as much as possible. Preliminary hot water injection of the gland or ligation of the superior thyroid vessels may be sometimes advisable though such a necessity has become much less frequent since the introduction of iodine.

The surgeon's responsibility to the patient does not end with the operation. Post-operative care must be meticulous. Lugol's solution should be administered routinely. Large doses may be necessary in severe cases. Symptomatic treatment and rest are important. Friends and relatives must be kept away. Sleep and rest are encouraged by the use of morphine and allonal. Fluids and alkalies should be given freely. Ice packs may be used frequently to combat elevation of temperature since the rate of metabolism increases about ten points for every degree of temperature.

After the patient recovers from the immediate effects of the operation, Lugol's solution in doses of ten minims a day should be prescribed for from two to three months following operation. The patient should lead a moderately quiet life during this period, though the activity of the patient without visceral impairment should not be limited for too long a time if the morbidity rate is to be considered as carefully as the mortality rate.

Early and accurate diagnosis, prompt surgery, careful pre-operative and post-operative management, and some dexterity in operative technic have brought the surgical management of goiter to a very satisfactory state. Of the patient with exophthalmic goiter, the severest of the toxic states, Pemberton goes so far as to say: "Today the patient with exophthalmic goiter is running a greater risk by postponing surgical treatment than in submitting to it." The same statement may perhaps apply equally as well to the majority of patients with all types of goiter.

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SUMMARY.

Both perfected surgical technic and a better understanding of the principles underlying diseases of the thyroid were mentioned as necessary for success in the surgical management of goiter. Attention was called to the important contributions to our present knowledge of goiter and its treatment.

Among these, Plummer's classification of goiter and his hypothesis of the pathologic physiology of goitrous disease were considered in some detail. The recent contributions to the pathology of goiter by Hertzler, Lewis, Rienhoff, and Thomas, were mentioned.

General features of the pre-operative and post-operative management were discussed. The importance of Lugol's solution in the pre-operative and post-operative treatment of cases with exophthalmic goiter and the misconception that Lugol's solution would cure the disease were stressed.

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LIVER ABSCESS.

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During the year 1926 we admitted to this hospital twenty cases of amebic liver disease, six of them being in the pre-abscess stage and fourteen being fully developed liver abscess cases. During the same period we had a total of 1,167 admissions, so these cases comprised slightly less than 2 per cent of our hospital admissions. We saw approximately five thousand patients in the dispensary (out-patient) service during the year, and since—so far as I know—all such cases diagnosed in the dispensary were later admitted to the hospital for treatment, we find that about 0.4 per cent of the patients seen by us during the year were liver abscess cases, either fully formed or in the process of developing. This is about a normal record for us.

Ameba histolytica is found world-wide throughout the temperate zones as well as the tropics, and, if one is not on the lookout for the various effects of its presence, it is often easy to overlook the real cause of many an illness. I want to call attention to one of its most important manifestations, its effects on the liver, by summarizing our cases of last year.

In this series there were no cases under ten years of age, and only one between one and twenty. There were five cases between twenty and thirty, eight between thirty and forty, four between forty and fifty, with one between fifty and sixty and one above sixty years of age. This corresponds with its general occurrence, for, while it may occur at any age, it is found most frequently in those between twenty and forty years of age.

Six cases were admitted in September, and five in August, while the others were pretty generally distributed throughout the year. Of course, most of our dysentery cases are admitted during the summer and early autumn, but I have never seen a liver abscess develop in any case of dysentery treated here or in any other hospital, so I can attribute no especial significance to the increase in these months of the liver abscess admissions. Any history of a previous dysentery attack that may be obtained usually occurrred months or years previously. August and September are perhaps our two busiest months, and this would have some influence, of course, but not enough to explain the greater number we had during these months.

One thing that attracts attention, and is characteristic of the disease, is the average long duration of the illness before the patient seeks medical aid. Of course, in the United States this would not be so apparent as here, but liver abscess is usually characterized by a long chronic course before admission. In this series,

three patients were of unknown duration, eight had been ill for one month or less, three of them had been ill for two months, one for four months, one for five months, one for seven months and one for a year. I might add that every year we have one or more of these cases giving a history running back for more than a year. I remember one who claimed to have been ill for three years, a story ordinarily hard to believe. These long continued cases are always greatly emaciated, almost exhausted, and have large lumps in the upper right abdomen with well formed abscesses, draining a large quantity of pus when aspirated. I have one case like this in the house as I write this, admitted five days ago with a history going back for seven months. I have had to aspirate this patient each day, each time getting from three to six hundred c.c. of pus. He is so very ill that he has been getting caffeine constantly ever since his admission until this morning.

Thirteen of the twenty were farmers, three were merchants, one a school-boy, one a carpenter, and one a potter, while the occupation of one is unknown, being more a beggar than anything else. Our farming population predominates to about the same extent as the above indicates, so the large proportion of farmers has, I think, no significance.

On admission, only one had a white cell count of below 10,000, while seven had a total white cell count between 10,000 and 15,000, six between 15,000 and 20,000, two had counts between 20,000 and 26,000, while one had a count of 36,000. The case that recurred had on his second admission a white cell count of 14,000. Three charts do not show a blood count, a good example of thinking you have an inflexible routine and finding that it does not always work. All our patients are supposed to have a complete blood count on admission, as a routine, but in the rush of work, with only two technicians in the laboratory, this is sometimes over-looked, especially in cases as self-evident as some of these cases are, when I would not have to wait for a blood count to assist in making a diagnosis.

The differential count in four cases showed less than 60 per cent polys; in five it was between 60 and 70 per cent; five others had either 70, 71 or 72 per cent polys; three had a poly count above 80 per cent, and the case readmitted had 69 per cent. The higher counts are unusual; in our experience, most are below 75 per cent.

I have made no effort to enumerate the number who had ameba or ameba cysts in their stools, although this would be interesting. Every patient on admission has a routine stool examination; this, however, does not include a stained specimen for ameba cysts. When I want this, I have to order it specially, and, although my technicians can do the staining, I have to look over the slide myself, since I have not trained them to look for ameba cysts sufficiently long to depend on their findings. I notice that I have failed to record my findings on the charts in far too large a number of cases, an easy thing to do in the rush of work incident to a one physician hospital like this one. So, to attempt to enumerate the number of times ameba were found, either in the pus or the stools, would give a totally erroneous idea of their frequency of occurrence. When the liver pus is aspirated, a specimen is sent to the laboratory and stained, for me to examine at my leisure, perhaps some days later. Sometimes I forget to look at the slide; more often I go over it but neglect to record what I find on the chart. However, in the great majority of cases, I believe, I do find vegetative forms of ameba in the liver pus, and often also cystic forms in the stools.

The routine stool examination showed hook-worm present in six cases, ascaris in five, and tape-worm in two cases, in each case in association with one of the other parasites, once with hook-worm and once with ascaris.

The trouble in the liver was situated eighteen times in the right lobe, and twice in the left lobe. This represents about the general occurrence, I believe. Also, nineteen of these patients were males, and one female. In liver abscess everywhere males predominate, but, according to Ludlow in his series for Korea, not to this extent. The use of alcohol is supposed to cause a condition in the liver making it easier for the ameba to get a foothold there, and in Korea, while the women often drink and some not very moderately, they do not drink to anything like the extent the men do. Practically every non-Christian man will be an habitual user of the native whiskey. This may explain the great preponderance of males in liver abscess, and also explain why Ludlow found more women with liver abscess up around Seoul (the capital of the country) than we do down here in the country.

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There was a palpable tender lump in the upper abdomen fourteen times, twelve times in the upper right quadrant and twice in the upper left quadrant. Sometimes the liver became quite large, extending down more than half-way to the umbilicus. In this series, in six cases there was no enlargement of the liver downwards, and in some of them where we aspirated and found pus, we could demonstrate little or no enlargement upwards. If enlarged, it will generally be tender on pressure, helping to differentiate it from hepatic cirrhosis or other enlargements of the liver which are not especially tender on pressure.

Ten of the twenty patients had cough, severe enough to necessitate having some form of cough medicine ordered. This can be easily understood, however, for an inflammation in the liver can cause irritation enough above the diaphragm to cause a cough.

Seventeen of the twenty gave a definite history of chills and fever, usually recurrent. It is easy sometimes to mistake a liver abscess case for malaria, while at other times it may be confused with a neglected tubercular case of long standing. I have made both of these mistakes, until a more careful examination and longer observation have shown me my error.

In these cases, in their treatment, all received emetine by hypodermic subcutaneous injection, generally in doses of one grain a day, during the whole of their stay in the hospital. One patient received only four injections, but his treatment was interrupted by his death on the fourth day. Three others received only six does each; one patient each received seven, eight and nine doses; two received ten doses; one each eleven and fifteen doses; four received sixteen doses each; one each seventeen, eighteen and twenty-two doses, and two patients received twenty-six doses. The only case that had a recurrence received one-half a grain dose a day after the first three days, receiving ten grains in sixteen days of treatment. As a general rule, we think they ought to have a grain a day, scaling the dose down, of course, for children.

Thirteen of these cases were treated by aspiration of the pus, and by emetine. Six of these were aspirated only once; three received two aspirations; three received three aspirations, and one was aspirated four times. One was operated on by incision and drainage and insertion of a drainage tube. It has been conclusively shown, I think, that aspiration of pus, when present, together with daily injections of emetine, is the treatment of choice in the usual case of liver abscess. We use an exploring needle to locate the pus; then a medium size trocar is inserted down to the abscess and the pus evacuated. The trocar is then removed and a wad of gauze placed over the small opening made by the trocar. One or two c.c. of one per cent novocain solution, a hypodermic for anesthetizing the skin and underlying tissues, another hypodermic with a large calibre needle to locate the abscess, a small knife for making a cut in the skin, and a trocar, are all the equipment needed. Many use only a hypodermic with a large needle, and dispense with the trocar. We try to introduce the trocar over the point of greatest tenderness, perhaps over the lump if there is one in the abdomen, or in an interspace between one of the ribs, usually near the lower costal border. In one of the cases here recorded, I remember that we aspirated through the posterior chest wall, down under the angle of the scapular. We did it here because we felt sure he had pus in the liver, and could not find it by aspirating over the usual sites. He was very tender on pressure over the lower posterior chest wall. I found what I thought was the point of greatest tenderness, inserted my needle, and obtained the characteristic liver pus.

Six of these cases were not aspirated, or, if aspirated, no pus was found. They were diagnosed as being in the pre-abscess stage,—really I suppose it would be better to style them cases of amebic hepatitis. Three of these had blood counts around 13,000 with poly counts of 51, 81, and 72 per cent. Another had 15,000 total W. B. C., with 86 per cent polys; another had a total count of 36,000. with 80 per cent polys, and the sixth case had a total count of 18,000, with 72 per cent polys. The duration of one of these cases is unknown; one had been ill for seven days, another for ten days, another for one month, another for two months, and the last one for a year. Two of these had palpable lumps in the abdomen; six did not. Those who did not have the lumps had well-marked areas of tenderness over the liver. In four of them there were distinct histories of chills and fever, and all cleared up promptly on administering

emetine. So, although no pus was found in these six cases, in each case we fully satisfied ourselves that we were dealing with a case of amebic liver infection. One of these cases was admitted with a tentative diagnosis of perinephritic abscess, was anesthetized, and an incision made over the kidney, with no result, when a closer examination showed us we had made a mistake in diagnosis, and that his trouble was actually in the liver. We gave him emetine and he made a quick recovery.

Of these twenty patients, one died the fourth day after admission. He was a very ill man on admission, age 66. The abscess had ruptured into the thoracic cavity, and he had developed an empyema; then it ruptured into a bronchus. He was expectorating liver pus containing vegetative ameba constantly, was very emaciated and weak, and it was evident from the first that he had little or no chance. One other case left too early, but was well started on the road to recovery; he insisted he was well, and would not remain longer for further treatment. I gave him some Alcresta tablets, with instructions to return if he again became ill, and also gave him a post-card, addressed to us, on which six weeks later he reported that he was entirely well and at work.

Summary.

1. In 1926, we treated twenty cases of liver abscess, or amebic disease of the liver, these cases making up approximately 2 per cent of our hospital admissions, and 0.4 per cent of the patients seen by us during the year.

2. Pus was found in fourteen of these, thirteen of whom were treated by aspiration and emetine, and one by open operation and emetine. No pus was found in six cases, all of whom were treated with emetine, and all of whom recovered.

3. There was one death in a case considered hopeless on admission; the other nineteen all made perfectly satisfactory recoveries.

4. We consider aspiration and emetine administration the best method of treatment in the usual case of liver abscess.

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SPLENECTOMY IN HEMORRHAGIC PURPURA—WITH REPORT OF A CASE.*

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Introduction.—There is a myth in medical history that the ancients operated on the spleen and removed the organ to improve the wind of marathon runners. However, there seems to be very little basis for accepting these cases as real. This myth was very widely known, as shown by the works of Shakespeare and other authors. It is probably true that surgeons years ago performed an occasional splenectomy for wounds of the organ and probably found out that the spleen was not necessary for life.

Modern splenic surgery is a development of comparatively recent years. Surgeons failed to recognize that the spleen belonged in their domain for so many years because of the obscurity of its normal function and the lack of evidence of its behavior in disease. That the spleen could be definitely removed in safety must have been known prior to 1880, because between twenty and thirty cases had been reported in the literature previous to that date, with a mortality of fifty per cent. By 1900 this number has been increased to nearly 300 cases. In the last twenty-five years this number had increased so that one clinic, the Mayo Clinic, has been able to report over 400 splenectomies.

W. J. Mayo, in the *American Journal of Sciences*, 171-313, 1926, analyzes over 400 cases in which splenectomy was performed. In sixty-eight cases the operation was performed for hemolytic icterus, with four hospital deaths. Eleven cases of chronic hemorrhagic purpura were relieved. Mayo believes these results to be among the most brilliant in surgery. His enthusiasm is mild for splenectomy in myelogenous leukemia. The results following splenectomy for splenic anemia were good, although ten per cent of the persons who recovered from operation died within ten years of gastric hemorrhage.

It is to be expected that the remote results will not be as satisfactory as the immediate results, particularly in splenic anemia, where

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success in large measure depends on the degree of the disease.

Until very recent years splenic surgery has been largely empirical, based chiefly on experience gained by observation of cases after operation. However, today, with the development of the modern laboratory, the function of the spleen has become better known, and certain phenomena occurring in its disease can be recognized. By its use, along with a clear history and a thorough physical examination, the differentiation of such diseases as hemolytic jaundice, splenic anemia, Banti's disease, the purpuras, pernicious anemia, and the leukemias can be made. I mention these diseases because the spleen is supposed to play some part in their pathology. Thus, by the improvement of the laboratory, better diagnosis can be made, and this type of surgery is placed on a most sound basis.

Now, let us consider the known functions of the spleen and the effects of its removal. The spleen is a part of the hemopoietic system along with the bone marrow, liver and lymph glands, and its functions are assumed by the other members of the system when it is removed. The exact manner in which the spleen acts is not definitely known, but certain facts about it are fairly well established:

1. It acts as a mechanical filter, removing from the blood substances above colloid size, such as protozoa and bacteria, which it sends to the liver for destruction.

2. It definitely destroys red cells. Thus, when it is enlarged in disease, naturally an anemia results.

3. It prepares the products of disintegration of the red cells for utilization by the liver.

4. It destroys blood platelets. In disease, as in chronic purpura hemorrhagica, abnormal numbers of platelets are destroyed, and this is the underlying etiological factor in this disease, though not necessarily the cause.

5. It forms lymphocytes. When the spleen is removed, this function is easily assumed by a compensatory hyperplasia of other lymph structures. Other debatable functions are the formation of purins, the storage of iron, and the regulation of cholesterin. It is probable that the spleen takes a very active part in the life of the embryo, but very little is known of the action.

Experimentally, the following results have been noted following the removal of the spleen in the normal animal:

1. Anemia, which lasts perhaps from six to eight weeks.

2. Increased resistance of the red blood cells to various hemolytic agents. This is borne out by the fact that transfused blood cells remain undestroyed over a much longer period after splenectomy.

3. Decreased bile pigment excretion. This fact offers a basis for splenectomy in hemolytic jaundice. As the number of red cells destroyed is reduced, there is less hemoglobin to unite in the formation of bilirubin, and hence a less tendency to jaundice.

4. An endothelial proliferation of the lymph nodes. This probably is a compensatory act to take care of the extra work occasioned by the removal of the spleen.

5. A compensatory hyperplasia of the bone marrow.

6. Increased phagocytosis in the liver. Here, again, the effect is probably compensatory.

Clinically, removal of the spleen causes very little embarrassment to the normal individual, and, according to the experiences of the best observers, one should live a natural life following its removal. Splenectomized individuals have withstood acute illness well, weathered severe accidents and have even given birth to healthy children. The operation itself is usually easily performed unless there are dense adhesions, and carries a low mortality rate. This last statement seems remarkable in view of the fact that most of the individuals operated are apparently such poor risks because of the marked anemia usually present. Successful splenectomy depends upon a careful diagnosis, and as a rule every case should be thoroughly observed over a considerable length of time before the operation is performed.

The development of splenectomy for cure of chronic purpura hemorrhagica is extremely recent. Many text-books published as late as 1923 do not mention the operation in their discussion of the treatment. In 1925, W. J. Mayo reported eleven cases which were apparently cured, and since that time the literature is full of reports of scattered cases. All authors are loud in their reports of the brilliant early results obtained, and are extremely hopeful of consideration of the re-

mote results. This hope seems well founded in view of the fact that many splenectomized individuals have enjoyed health over a long period of years. All authors are of one accord in the belief that the success of splenectomy depends upon a very definite diagnosis.

From the obscure symptomatic purpuras a clinical entity has emerged which in the typical case is sufficiently definite to take the name essential thrombo-cytopenic purpura or chronic purpura hemorrhagica. This condition has five very distinguishing characteristics:

1. Bleeding from the mucous surfaces, accompanied by the petechial hemorrhage.
2. Deficiency of blood platelets.
3. Greatly prolonged bleeding time.
4. Non-retractile clot formation.
5. Usually an enlargement of the spleen.

Purpura is classified by Minot and Lee as follows:

1. Purpura hemorrhagica, which may be congenital or acquired, or acute or chronic.
2. Simple symptomatic purpura, which is usually present with definite disease, such as acute infection, septicemias, spinal meningitis. It may be produced by such drugs as copaiba chloral, mercury, arsenic, quinine and diphtheria antitoxin. It also may occur along with chronic nephritis and such blood dyscrasias as leukemia, pernicious anemia and aplastic anemia. It may be differentiated from hemorrhagic purpura in that the blood platelet count is usually normal and there is no bleeding from the mucous surfaces. This type of case will get well as the accompanying disease is cured, or the toxic cause is removed.
3. Idiopathic purpura, which may occur by itself, but is much more often associated with one or more of the following conditions: Visceral manifestation or so-called Henoch's purpura, arthritis or Schœnlein's disease, commonly called purpura rheumatica, edema and erythema. Here, again, in this type of condition the blood platelet count is normal and there is rarely bleeding from any mucous surface, and complete recovery is the rule in most cases of idiopathic purpura, although sometimes chronic cases almost approach the hemorrhagic stage.

Hemorrhage from the mucous membranes is the clinical feature which distinguishes purpura hemorrhagica from other forms of purpura. Epistaxis is the most frequent form, although hemorrhage from the gums is common; bleeding likewise occurs frequently from the uterus, the gastro-intestinal and the genito-urinary tracts. Hemorrhage into the brain may cause death. Rarely does hemorrhage occur in the joints. The petechial hemorrhages may vary in size from a very fine rash up to two centimetres in size. Ecchymosis from the slightest cause is common. Application of a tourniquet will cause the fine rash to appear above the tightened area. This is a rather definite test for the condition. Naturally these hemorrhages will produce marked anemia, which is always evidenced by extreme weakness, loss of weight and pallor. The acute cases are accompanied by temperature as high as 102°. The milder cases seldom have fever. The acute cases have a tendency to become chronic, and the chronic cases have a tendency towards remission. The disease occurs at any age, although more prevalent between the ages of ten and twenty-two. The disease may be either acquired or congenital. Acquired cases are attributed to infection, focal and systemic, and to toxic causes, such as arsphenamine injections or benzol poisoning. In the acquired forms, cures will result if the cause can be discovered and removed.

Purpura hemorrhagica must be differentiated from all conditions in which simple purpura occurs as a manifestation, such as aplastic anemia, pernicious anemia, the leukemias, the acute infections, scurvy and idiopathic purpura and hemophilia. If an examination of the blood is made in every case of hemorrhage and in every case of purpura, as it should be done, there will be little difficulty in recognizing a case of purpura hemorrhagica. Just a word about hemophilia, which is often confused with chronic hemorrhagic purpura. Hemophilia is never found in females, and is rarely accompanied by purpuric spots. Further, hemophilia is characterized by a prolonged coagulation time, a normal bleeding time and a blood clot which will retract in the normal manner, while in purpura hemorrhagica the bleeding time is prolonged, the coagulation time normal, and the clot will not retract normally.

The chief pathologic feature of hemorrhagic purpura is the diminution of platelets. This fact was first observed by Denys and later by Hayem. The number of platelets vary normally from 200,000 to 400,000 to each cubic centimeter of blood, with 5,000,000 red cells

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and 5,000 white cells. The tendency to hemorrhage is proportionate to the diminution in platelets. When the platelets are below 100,000, this tendency is marked. Diminution in platelets seems to be brought about in three ways:

1. By a destruction of depressed activity of the megakaryocytes, bone marrow cells from which they are formed. This condition might be produced by the effect of poisons, such as benzol or arsphenamine injections.

2. The second manner in which the platelets might be reduced is by replacement of the megakaryocytes by abnormal cells, such as in the leukemias, or in the presence of malignant tumors of the bone.

3. The third way in which platelets may be reduced is by destruction in some other part of the body. This seems to be borne out by the fact that there is a marked increase in the platelet count following splenectomy, and the sinuses of the spleen are engorged with blood platelets. "Splenectomy in hemorrhagic purpura therefore does not necessarily eliminate the underlying cause of the disease, but in removing the destructive agent it often renders the disease ineffective."—(W. J. Mayo, Surgical Clinics of North America, April, 1924, p. 774).

The prolonged bleeding time and non-retractile clot are so characteristic in purpura hemorrhagica that it may be explained on the basis of deficiency in platelets. On this basis it is easy to conceive that there is just sufficient material to clot most of the fibrinogen, but not enough to clot it rapidly—hence the prolonged bleeding time. The soft non-retractile clot can be explained by the fact there are not enough platelets present to form a strong network as a basis for the clot. The bleeding time is sometimes prolonged between one and two hours.

Purpuric eruptions cannot be explained on the basis of blood platelet deficiency, since these eruptions occur in all forms of purpura. This phenomenon is but little understood. There are indications that minute change occurs in the small blood vessels of the body.

Enlargement of the spleen is usually found in hemorrhagic purpura. The cause of this enlargement is not definitely known; however, it is a known fact that increase in the size of the spleen in typhoid fever, malaria and syphilis is an attempt to remove diseased organisms from the blood stream. When the spleen is removed in hemorrhagic purpura a marked hypertrophy is noted and the sinuses are found to be engorged by deteriorated red cells and blood platelets.

Treatment.

Acute purpura is alleviated by the transfusion of blood, which not only causes an improvement in the anemia, but also supplies blood platelets which aid in checking of hemorrhage from the mucous surfaces, and under the skin. The benefits will last only so long as the blood remains in the circulation and frequent transfusions are necessary to tide the patient over the acute stage. Careful history and thorough physical examination will often reveal the cause of chronic purpura hemorrhagica and its removal may effect a cure. After careful study in obstinate cases, splenectomy will produce brilliant cures by removing an organ which is destroying more of the vital elements of the blood, namely, the red blood cells and platelets, than it normally should.

Case Report.

Mrs. Lloyd S., age 33 years, was admitted to the hospital January 17, 1927, complaining of weakness, with bleeding from the gums, nose, and womb, and petechial hemorrhages over the entire body, with the exception of the face, hands and feet.

Family History.—Mother living and well, age 65. Father died age 55, following gall-bladder operation. One brother and five sisters living and well. Two sisters and one brother died as infants, cause of death unknown. There is no history of abnormal bleeding in the family.

Past History.—As a child patient had measles, mumps, and whooping cough. There has been no unusual illness in the patient's life except headache, which occurred almost every day until she was 22 years of age. Menstruation began at the age of 17, and has always been regular at twenty-eight day intervals. Periods lasted from five to seven days with more than the average flow. Patient was married in 1914, and has been the mother of four children—two of whom were still-born. First still-born child was attributed to the fact that the mother suffered with epidemic influenza during her pregnancy. Second still-born child

was delivered three years ago, cause unknown. The two living children are well and healthy.

Present Illness.—This can be dated back to July, 1926, when patient noticed several large, unusual bruises on her body. Very little attention was paid to these bruises. In August, there was a prolongation of menstruation, and patient felt very weak. Normal periods were experienced in September and October. In November there was a marked uterine bleeding at her regular period. This hemorrhage was so profuse that it necessitated the calling of her physician, who placed her in bed. During the latter part of November the patient's gums bled. This checked very promptly, but again the middle of December the gums and nose bled constantly. Also about this time hundreds of little petechial hemorrhages appeared.

On December 23rd, patient was admitted to the Petersburg Hospital and a diagnosis of hemorrhagic purpura was made. Her laboratory findings at this time were—hemoglobin, 21%; color index, 50; coagulation time, two minutes; reds, 2,150,000; whites, 4,800; polys., 70%; lymphs, 28%; basophils, 2%; bleeding time, 23½ minutes; platelets, 100,000; moderate poikilocytosis.

On December 24th, patient was given 500 c.c. of blood by the Unger method. There was no reaction. Patient left the hospital the next day feeling much stronger. The gums and nose bleed checked promptly, and patient was discharged to return in another week for transfusion. During this week there was a very marked menstrual bleeding.

On December 31st, patient was re-admitted to the hospital. Laboratory findings were—hemoglobin, 21%; color index, 48; coagulation time, two minutes; red cells, 2,160,000; white cells, 13,600; polys., 81%; lymphs, 16%; basophils, 2%; e. o. s., 1%; platelets, 211,000; bleeding time, 6 minutes. She was given 500 c.c. of blood by the Unger method, which was followed by a moderate chill, but no elevation of temperature.

On January 1st, patient was discharged from the hospital, feeling stronger, there being no hemorrhage from gums or nose.

On January 17th, patient was re-admitted to the hospital, bleeding from the gums and nose. There were many hemorrhages in the skin, especially on the limbs. Laboratory findings were as follows: Urinalysis, negative; hemoglobin, 20%; color index, 46; red cells, 2,170,000; white cells, 6,400; polys., 71%; lymphs, 27%; basophils, 2%; bleeding time, 18 minutes; Wassermann, negative.

The physical examination on same date was as follows: Patient is a very pale, white woman; age 33.

Pupils.—Regular and react to light and accommodation.

Teeth.—Several teeth with caries; slight pyorrhea of the lower gums.

Mouth.—Large hemorrhagic spot in roof of mouth. Gums normal in appearance.

Heart.—No murmurs; no enlargement; pulse rate is regular and of good volume, with a rate of 120. Blood pressure—systolic 110, diastolic 65.

Lungs.—No rales are heard over either lung; breath sounds are clear and both bases expand equally. The percussion note is hyperresonant.

Abdomen.—Flat and soft, with no abnormal masses.

Liver.—The lower margin of liver cannot be palpated. Has no apparent enlargement of liver on percussion.

Spleen.—The lower margin of the spleen can be palpated at level of the umbilicus.

Neurological.—Normal reflexes are present and active. No abnormal reflexes are noted.

Skin.—The entire skin of the body is mottled with petechial hemorrhages, ranging in size from the size of a dime to the size of a fifty cent piece. Some of these spots are fading. The hemorrhages are most marked on the calves of the leg. A large bruise is noted on the anterior surface of the right thigh. The patient remembers no injury at this point. There are marked imprints of rubber supporters just above the knee. There are no palpable lymph glands over the body.

January 19th.—On this date patient was first transfused with 500 c.c. of whole blood, and then, through a left rectus incision extending from the umbilicus to the ninth costal cartilage, the spleen was removed. There was only moderate hemorrhage, and patient stood operation well.

January 20th.—General condition excellent. There has been no sign of any oozing from any mucous surface, and there are no new purpuric spots. The blood findings showed—hemoglobin, 25%; red cells, 2,670,000; white cells, 21,800; blood platelets, 352,000; bleeding time, 5 minutes.

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January 24th.—General condition excellent. Hemoglobin, 26%; red cells, 2,710,000; blood platelets, 552,000.

January 27th.—Wound dressed, stitches removed, wound clean; patient is making an easy recovery with the exception of temperature of 101° in the afternoons. There has been no unusual incident in her convalescence.

January 29th.—Patient complained of pain behind right knee. Examination revealed a tender fluctuating mass, which was opened and drained. Cause of this abscess formation was unknown.

February 2nd.—Temperature continued to run 100½°. Wound back of right knee was still draining pus.

February 5th.—Seventeen days after operation patient was discharged in good general condition. The wound behind her right knee was still draining slightly. Her temperature ranged up to 99½° in the afternoon. Patient said she felt better than for years.

February 21st.—Patient was up and feeling well. She had no tendency to abnormal bleeding. She had been through her menstrual period with less bleeding than usual. Her blood count on this date was as follows: Red cells, 3,460,000; white cells, 17,000; hemoglobin, 45%; polys., 61%; lymphs, 36%; e. o. s., 1%; trans., 2%; urinalysis, negative. Her temperature still ranged to 99½° in the afternoon. Since her operation she has gained 25% in hemoglobin and nearly 1,500,000 in red cells in a period of three weeks. Her bleeding time has dropped from 15 to 4 minutes, and the platelet count has increased from 100,000 to 500,000.

TWINS.

By J. LEWIS RIGGLES, M. D., F. A. C. S., Washington, D. C.
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Hydramnios or polyhydramnios is usually very marked in multiple pregnancies and the diagnosis is not made until the first baby is born. This excessive fluid should always make us suspicious of either a multiple pregnancy or of a monstrosity. In sub-acute cases developing around the 8th month the abdomen sometimes becomes enormous, making sitting erect impossible and the dyspnea is so great the patient can not get in any comfortable position and suffocation seems imminent.

One of my cases was that of a doctor's wife who was brought to my office from out of the city in an automobile. She was in a state of extreme shock and exhaustion from dyspnea and the greatly distended abdomen. I immediately transferred her to Columbia Hospital. On examination I found the membranes protruding through a partially dilated cervix, which I ruptured, allowing the escape of two gallons of amniotic fluid. The baby, an undeveloped achondroplastic dwarf, was born dead one-half hour later—8th month of gestation.

Twin pregnancies, when diagnosed before labor, should not be looked upon with fear or anxiety because complications are quite unusual; most of them are premature and of small size—from 3 to 6 pounds in 80 per cent of the cases. Many do not survive and, although the presentation may be in any position, they are delivered spontaneously.

On the other hand, occasionally they go to term, which should give concern as to the management of labor.

The large over-stretched uterus has not much endurance and the labors are usually very slow and inertia is a consequence, requiring interference on the part of the obstetrician.

If the patient should go to term and her abdomen is very large, then we must not forget the following possible complication, viz.: Premature rupture of the membranes with prolapse of the cord; malposition of either twin; toxemia and eclampsia; premature separation of placenta, or collapse of the mother from exhaustion. Also, after delivery of twins the danger of hemorrhage is great,—even before delivery of the placenta. This emergency should be promplty dealt with by Crede's expression, not waiting for the uterus to rise. Manual extraction of the placenta may be necessary, but I am strongly convinced that this is dangerous, because the peripheral shock following this procedure is most alarming. Although I have many times manually extracted the retained placenta for different reasons, it has occasionally been followed by peripheral and general shock, at which time the patient is in collapse, the radial pulse cannot be felt, and the only signs of life are the slow beating of the mother's heart. Stimulation and quiet, however, usually bring good results. Constant watching and large doses of pituitrin are necessary to insure contraction and retraction of a feeble uterine musculature.

The X-ray diagnosis is most important but

not always necessary. If the hydramnios is not great, diagnosis of the position of at least the first twin should be made without difficulty, and the second is usually diagnosed and delivered when the presenting part enters the cervix,—and only then.

I did not make the diagnosis in one of my own cases which went to term because of polyhydramnios. No part of either twin could be felt through the tense abdomen. Vaginally, a breech presented, after delivery of which I was confronted with a prolapsed arm. This was replaced, a foot drawn down and version and extraction was easily accomplished. Both babies lived. Weight—6 pounds and 2 ounces (male) and 5 pounds and 10 ounces (female). The mother's recovery was uneventful. The babies were nursed every four hours until the eighth month.

An unprecedented experience at Columbia Hospital was that during 1927 there were born 14 sets of twins.

Their weights were as follows:

No. 1. 1st—4 lbs., 6 ozs. 2nd—4 lbs., 4 ozs.
No. 2. 1st—3 lbs., 13 ozs. 2nd.—3 lbs., 13 ozs.
No. 3. 1st—7 lbs., 10 ozs. 2nd—7 lbs., 4 ozs.
No. 4. 1st—5 lbs., 3 ozs. 2nd—5 lbs., 4 ozs.
No. 5. 1st—13 ozs. 2nd—14 ozs.
No. 6. 1st—5 lbs. 2nd—6 lbs., 10 ozs.
No. 7. 1st—5 lbs. 2nd—5 lbs., 8 ozs.
No. 8. 1st—4 lbs., 2½ ozs. 2nd—4 lbs., 6 ozs.
No. 9. 1st—7 lbs., 5 ozs. 2nd—6 lbs., 8 ozs.
No. 10. 1st—4 lbs., 6 ozs. 2nd—2 lbs., 14 ozs.
No. 11. 1st—4 lbs., 9 ozs. 2nd—5 lbs., 12 ozs.
No. 12. 1st—3 lbs., 14 ozs. 2nd—4 lbs., 3 ozs.
No. 13. 1st—6 lbs. 2nd—6 lbs., 14 ozs.
No. 14. 1st—4 lbs. 2nd—4 lbs., 8 ozs.

It is interesting to note that in the prematures the second twin was heavier, whereas in the cases that were viable and went to term or near term the first was the larger.

The case I wish to report was that of a multipara I, age 22, Mexican of the higher class. She came to me in the early months of pregnancy. Her calculated time for confinement was Dec. 27, 1927. She was delivered Dec. 22, 1927. Examination up to the eighth month revealed nothing abnormal, when there was noticed a marked increase in the size of the abdomen. I discovered the twin pregnancy at that time and so informed her. There was not a large amount of hydramnios and you could easily palpate a head over the bladder region and another under the liver. Two widely separated heart sounds were heard,—one in right lower quadrant, the other in left upper quadrant. Repeated examinations and counting of the two hearts were made. We found them always to be synchronous—130 per minute. She began her labor at 10 P. M., Dec. 21, 1927, with weak and infrequent pains which continued throughout the night. Labor was very slow and pains were at no time hard or bearing down in character. During the next morning they became farther apart and finally stopped. Besides the inertia she went into collapse, with pulse 110, so that interference was necessary.

Vaginal examination revealed a fairly large head in ROP position. Membranes ruptured. I rotated to ROA and delivered with forceps. Live male baby, wt. 7 lbs., 5 ozs. I immediately examined for the presenting part of the second twin. After rupturing its sack, I found vertex in LOP position. This was rotated to LOA and delivered with little difficulty with forceps. Live male baby, wt. 6 lbs., 8 oz. Total weight of babies 13 lbs., 13 ozs. The two placentae, which were joined, were immediately expressed by Crede's method. Patient had no post-partum hemorrhage, and made an uneventful recovery.

There is nothing new or unusual in this little review, but it might be interesting to those who have not had twin babies near or at term.

1621 *Connecticut Avenue.*

DENTITION—IS IT A PATHOLOGICAL PROCESS?*

By SAMUEL NEWMAN, M. D., Danville, Va.

A consideration of the history of medical thought with regard to the physiological process of dentition would present the story of the evolution of modern medicine, or at least as it relates to the struggle of scientific pediatrics to rid itself of the grossest medical absurdities.

The term dentition refers only to that stage of development when the tooth is penetrating the superficial tissues of the gum; it commences about the sixth month and it is finished by the end of the second year at which time the second molars erupt. The permanent teeth erupt between the sixth and seventeenth or the twenty-first year.

For various mistaken reasons dentition was held accountable, directly or indirectly, for almost all the ills of infancy. Even to this very

*Read by invitation before the Danville Dental Society, November 21, 1927.

day the crude superstitions clustered about dentition are tolerated, or even entertained, by many members of the medical profession.

Chapters on alleged disorders of dentition are to be found in the early medical writings. The methods of treatment of this supposedly difficult process are absurd. During the earlier centuries, A. D., the application of brains of hares was recommended. Heated discussions are to be found on the question whether the brains should be roasted or boiled. The physician of Julius Caesar recommended the use of cyprus butter and lily oil instead of the brains of the hare. The efficacy of all sorts of charms, ranging from necklaces of amber beads to mystic plants and animals is believed in by considerable elements of our present generation. In practice it is not a rare experience to see a mole's foot strung about an infant's neck as a remedy for difficult dentition.

The attitude on this matter of dentition among pediatricians is very decided. We find the erroneous notions about dentition a great obstacle to scientific practice among children. Not only are common manifestations of infantile derangements, such as fever, restlessness, peevishnes, diarrheas, and colds attributed to teething, but even such serious conditions as otitis, convulsions, infectious diarrheas, pneumonia, diphtheria and other major disorders are passed up by an ignorant laity as *teething*. I have on record a case of cerebrospinal meningitis that was complacently regarded by all attendants as a derangement due to teething.

Before referring to my own observations on this question of teething, which has interested me very keenly from the first day I entered upon the study and practice of pediatrics, I shall cite opinions of a few leading authorities.

In an article on dentition, by John Dorning,[1] the following statements are to be found:

"Very often trifling disorders that are viewed as evidences of difficult dentition are directly or indirectly dependent upon rachitis. This is one of the most common of children's diseases, and, frequently, a mild form of the affection passed unrecognized because its symptoms have received a wrong interpretation. * * * Most of the earaches in children are dependent upon acute otitis, and many an otitis is neglected until the organ of hearing is irreparably damaged, because 'the doctor said the ear would stop running when he (the child) would cut all its teeth.'"

I might say here that, though the above had been written nearly forty years ago, one often meets with cases of otorrhea which are attributed by parents as due to dentition. The lay superstition of today merely reflects medical thought of yesterday.

I am often besieged by requests from mothers to lance the baby's gums. That this obsolete custom is still prevalent in certain localities is a sad comment on what lay beliefs and professional conscience will stand for. I shall quote further from the same author:

"It is not many years since the gum-lancet was considered the catholicon for nearly all infantile maladies. At the present day it has fallen into well-merited disrepute. As J. Lewis Smith remarks, it is used more by the ignorant practitioner, who is deficient in the ability to diagnosticate obscure diseases, than by one of intelligence who can discern more clearly the true pathological state. Gum-lancing is not objectionable because of pain, the possibility of severe hemorrhage, injury of the tooth, or any difficulty attending the operation, but because it is an absolutely useless procedure so far as it affects the eruption of a tooth. There is no tension of the overlying gum; for an incision, whether linear, crescentric, or crucial, does not gape. * * * Every one has heard of cases where a cutaneous eruption disappeared, convulsions ceased, diarrhea stopped, fever abated, and quiet slumber ensued after the gums had been lanced. But it is more than likely that in every instance it was a pure coincidence, or the result of the hemorrhage (a blood letting), or of imagination on the part of those interested. Every intelligent observer knows that infantile derangements frequently get well spontaneously,—good ground for being skeptical about many of our vaunted therapeutic measures."

The above citations were written by an author nearly forty years ago. I shall now refer to a modern author, John Lovett Morse. Morse,[2] in discussing disturbances of dentition, states the following:

"In spite of all that has been said and written regarding the infrequency of disturbances in infancy as the result of dentition, the tendency of the laity and also of many physicians, who ought to know better, is still to attribute to dentition all sorts of symptoms and diseases which have no relation to dentition, except that they occur at the same time. It is evident how foolish this is, when it is remembered

that dentition is a process which begins *in utero* and is not completed until the eruption of the 'wisdom teeth', which seldom occurs before the seventeenth year. Nevertheless, babies and children are well most of the time. No one attributes miscarriages and congenital deformities or repeated colds and indigestion in late childhood to dentition. It would seem as reasonable to do this as to attribute many of the ills of infancy to it. The diseases and disturbances which are laid to dentition are almost invariably due to something else. * * *"

Finkelstein,[3] perhaps the keenest pediatric clinician of the age, on the subject of difficult dentition expresses himself as follows:

"The process of dentition takes place as a physiological phenomenon without any disturbance. Nevertheless, since ancient times has the teaching concerning difficult teething played a great role in all nurseries. * * * It may be admitted that particularly at the eruption of the molars, there may be restlessness, sleeplessness, salivation and erythema of the buccal mucous membrane. Even a slight degree of temperature may manifest itself. However, these manifestations are to be viewed as accidental occurrences resulting from other ailments which may cause a slowing down of the process of dentition. * * * The most that can be granted is that in rachitic and spasmophilic children dentition may be the exciting moment of the underlying pathological tendency. * * * At all events, any treatment, including the lancing of the gum, is absolutely uncalled for."

Fischl,[4] Professor of Pediatrics at the German University of Prague, in his contribution on this subject, makes the following statements:

"I consider it as one of the most happy advances of modern pediatrics that the chapter on disturbances of dentition, which used to occupy such a prominent place in the older textbooks has disappeared from the new ones. * * * The knowledge of the simple anatomical fact that the process of dentition extends over months and years would seem sufficient to cure one of the mistaken notion. * * * If one were to take the trouble to follow up the various stages of dentition in the normal child, he would not find a shadow of fact to justify the assumption that the teeth are in the least way responsible for any disturbance."

Jacobi,[5] the father of American pediatrics, states:

"Dentition is a physiological process; before a tooth protrudes, the gums above it are slowly absorbed so as to show a slight depression, with no hyperemia. * * * The only perceptible symptom is the eagerness of the baby to bite. Increased salivation has nothing to do with dentition, but with the increased function of the salivary glands, which, like the growth of the teeth, of the head and of the brain, is the result of the physiological hyperemia of that part of the body connected with the large size of the carotid arteries. * * * Diarrhea is not a result of the normal teething process. * * * Lancing the gums, which, with calomel, used to be the every-day treatment of infants at the time of teething has lost most of its charms."

In my own practice I take great pains to gather information on the question of difficult dentition. Mothers are requested to inform me of the exact day of the eruption of a tooth and careful inquiry is made concerning any attending ailment. I have on record hundreds of mothers who could testify with pride that their infants erupted all their teeth without any disturbance whatsoever. I have also a considerable number of cases where complaints were reported attending the eruption of the teeth. In almost all of these cases, where examination of the infant was permitted, a palpable cause for the disturbance could be found, such as improper feedings, grippe, nasopharyngitis, otitis, bronchitis, the common cold, etc. In almost all of these cases the gums were of normal color and no swelling could be discerned. Once, however, I had the occasion to use the gum-lancet. The gum over an erupting molar was swollen, fluctuating and filled upon incision, with a few drops of thick, black blood. This condition probably followed the attempt at "rubbing the gum through." This procedure (rubbing the gum through) is irrational for the simple reason that the eruption of a tooth does not proceed by a process of *cutting* through the gum. The very term "eruption" is a misnomer. The gums are composed of a dense fibrous tissue, closely connected to the periosteum of the alveolar processes. They are covered by a smooth vascular mucous membrane, which is remarkable for its limited sensibility. When the teeth are ready to erupt, the bone between them and the gum is absorbed (Gray's Anatomy). Ulceration of

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the gum over a tooth I observe now and then, though rarely, which might have been due to the impingement of a sharp corner of a corresponding tooth that has erupted in the opposite jaw. An occasional case of gingivitis or stomatitis may be seen associated with dentition. However, it occurs mostly among infants of the lower social strata,—at least my experience is pretty definite on this point. The infants are debilitated, bottle-fed, poorly cared for. The nursing-nipples, teething-rings, filthy sugar-teats, thumb-sucking and irritating medicines and general unhygienic surroundings would amply account for the occurrence of these pathological mouth conditions—and not in the least related to dentition. From a dental standpoint, it would seem unreasonable to presume that the absorption of the overlying gum tissue causes pain when the highly sensitive nerve-filament that forms a part of the pulp of a milk-tooth becomes obliterated together with the substance of the fang, without pain or inflammation, to make way for the permanent tooth.

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UNDULANT (MALTA) FEVER.*

By ADAH CORPENING, Richmond, Va.

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Undulant fever has been known since 1887. It was originally called Malta fever from the fact that it was prevalent on the Island of Malta, though it also occurred in other sections along the shores of the Mediterranean. The microorganism causing undulant fever has been known by various names, but is now commonly called Brucella melitensis.

The disease was found to be spread by goats' milk and was at first thought to be spread in no other way. In recent years, however, it has been found that this disease is not confined to any one locality, but is quite general in its distribution. It has also been found that goats' milk is not the sole means of spread, but that cows' milk also serves as a vehicle of transmission. The explanation of this was furnished by Alice Evans,[1] of the Hygienic Laboratory, who has proved in recent years the virtual identity of the organism of contagious abortion in cattle with Brucella melitensis of Malta fever.

*Read before the Health Officers section of the Virginia Public Health Association in Suffolk, January 5, 1928.

Organism

The trend of present day opinion is to regard the two organisms Brucella melitensis and Bacillus abortus, if not absolutely identical, as at any rate so closely related as to place them under a single new genus "Brucella." Brucella melitensis was isolated from infected goats or cases contracted from the drinking of goats' milk, while the Bacillus abortus variety was isolated from cattle or cases of undulant fever in man.

Characteristics of the Disease

Lake[2] states that Malta fever may occur in every degree from a mild ambulant type, which may easily escape detection, to very acute cases with an abrupt onset and which may persist in chronic form for from many months to several years.

Bevan[3] states that not infrequently cases are at first mistaken for malaria or typhoid until blood examinations and agglutination tests reveal the true nature of the disease. The chief symptoms appear to be pyrexia, headache, anaemia, swollen spleen and liver, and pain in the joints. Neuritis and sciatica and occasionally orchitis follow.

Bruce[4] has defined Malta fever as "a disease of long duration, characterized clinically by continued fever, profuse perspiration, constipation, frequent relapses, rheumatic neuralgic pains, swelling of joints or orchitis; bacteriologically by the presence in the blood and organs of Brucella melitensis, or Bacillus abortus."

Orr and Huddleson[5] state of the sixteen cases studied in Michigan only five were tentatively diagnosed as undulant fever by the attending physicians, and this happened only after much publicity had been given to the subject.

Occurrence

In 1905 Craig[6] reported a case of Malta fever which was the first on record originating in the United States. The patient was a hospital nurse. There was no case of Malta fever

at the time of her attack, but she had previously been attending sick soldiers in a hospital in Washington, D. C.

In 1920 there were a number of cases of undulant fever at Alexandria, Virginia. At that time contagious abortion was known to exist among cattle on the farms in the surrounding country. At this time the milk supply of Alexandria was not under municipal control. Very likely a considerable portion of the Alexandria patients were using raw milk containing the abortus variety of Brucella melitensis. I have been unable to find any accurate record of this outbreak.

In the summer of 1922 there occurred in Phoenix, Arizona, the first real epidemic of Malta fever that has so far been recorded in the United States. There were thirty-seven patients giving positive evidence of Malta fever. All of the patients except five had used goats' milk previous to the epidemic. Brucella melitensis was isolated in pure culture from the blood of some of these patients.

Orr and Huddleson[5] report sixteen cases investigated in Michigan since June, 1926. In six of these cases Bacillus abortus was isolated. The remaining ten cases not only gave typical clinical symptoms of undulant fever but also gave specific agglutination with Bacillus abortus in dilutions ranging from 1 to 640 to 1 to 10,000. All of these cases had used raw milk in varying quantities.

With approximately one-third of the cattle in Michigan infected with contagious abortion and a large part of the milk unpasteurized, it is hard to account for the small number of human cases of the infection, thus it would appear that the susceptibility of man to the abortus variety of Brucella melitensis must be relatively slight.

During 1927 Dr. John Powell Williams reported two cases of undulant fever from hospitals in Richmond, Virginia. One case at Sheltering Arms Hospital, from Howardsville, Virginia, and the other case at St. Luke's Hospital, from Brodnax, Virginia. Pure cultures of Bacillus abortus were isolated from both of these cases by Dr. Shaw of the Medical College of Virginia.

Laboratory Methods of Diagnosis

The causative organisms have been isolated in pure culture from the blood, urine, and amniotic fluid of goats and cattle. In man the organism has been isolated from the blood of patients with undulant fever. This is sometimes very difficult to do and, in some cases giving a typical history, the organism has never been isolated. How long the organism will remain in the blood stream we do not know. We do know, however, that repeated blood cultures sometimes give positive results following a number of negatives. Why this is so is not known.

For best results it has been suggested that blood cultures be taken in the afternoon and during a rising temperature. It is necessary to have a much larger quantity of blood than is ordinarily used for culture work, not less than 20 c.c.

The laboratory method that is used most extensively is the agglutination test. However, this cannot always be relied upon as agglutination can often be obtained in low dilutions with normal serum, and some typical cases of undulant fever never show agglutination in dilutions above 1 to 5. Opinions vary widely as to the titre of agglutination that can be relied upon as of diagnostic value. A positive reaction in low dilutions may have four possible explanations: (1) The reaction may not be specific; (2) the agglutinins may have been acquired in a secondary manner by absorption in the intestines from the agglutinins present in the milk that had been ingested; (3) the agglutinins may have been produced as the result of an infection sometime in the past; (4) they may indicate a present infection. It may be that one explanation would apply in one case and another explanation in another case. Consequently, the degree of agglutination necessary to justify a diagnosis depends largely upon the history of the case.

It must be borne in mind that the only sure diagnosis is a positive blood culture.

We can no longer think of undulant fever as a disease of the Mediterranean countries only, caused by the drinking of goats' milk, but must keep in mind that it is an infection not uncommon even in our own state; that the causative agent is the same organism that causes contagious abortion in cattle, and that raw milk from cows infected with contagious abortion is a source of danger to persons susceptible to the abortus variety of Brucella melitensis.

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THE TREATMENT OF GALL-BLADDER DISEASE.*

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The treatment of gall-bladder disease, although chiefly a surgical problem, is not exclusively so. The happiest results depend upon a close co-operation between the internist and the surgical consultant.

When the question of diagnosis has been satisfactorily settled, the case usually becomes one of gall-stones, of cholecystitis, or of a combination of the two.

Although "silent" gall-stones have been noted, the statement has been made that there are no "innocent" gall-stones,—their mere presence being sufficient cause for their removal.

Attacks of gall-stone colic tend to subside, but they also have a strong tendency to recur, the subsequent attacks coming at shorter intervals and being more severe. The same holds true for cholecystitis. The chances for spontaneous recovery from a given attack of either gall-stones or cholecystitis will usually be good, but the relief is only temporary and the recovery only relative. Between attacks the patient has ordinarily more or less indigestion, which may become constant and annoying, even if not disabling or dangerous.

Because of these considerations, the treatment of gall-stones and cholecystitis is mainly a surgical question. For convenience, this treatment may be discussed under its pre-operative, operative and post-operative phases.

Pre-operative Treatment.—It is best, when possible, to perform the necessary operation in an interval between attacks. The patient is better able to withstand the ordeal, and the local conditions are more favorable. Not infrequently, pre-operative treatment is obligatory,—for example, where there is advanced derangement of the circulatory organs or of the kidneys, or where there is an associated diabetes. In such cases, the control of the accompanying conditions is of first importance and governs the outcome of the case. Marked and progressive jaundice demands treatment prior to operation, because of its interference with the proper clotting power of the blood and the consequent increased tendency to hemorrhage. It is best controlled by giving large quantities of fluid by mouth and by the Murphy drip, and by the oral administration of fifteen grains of calcium lactate three times daily for two or three days prior to operation. Sometimes it is necessary to give the chloride of calcium intravenously instead of the lactate by mouth. Where contra-indications do not exist, saline laxatives daily are beneficial.

The usual regimen preparatory to operation is: Rest in bed; morphine enough to relieve pain and secure relaxation, and liquid diet, in the acute stage. Where nausea and vomiting will not permit sufficient intake of liquids by mouth, fluids or nutritive enemata are given by bowel. Laxatives are often inadvisable, and in such cases cleansing enemata are employed. The judicious use of an ice-cap on the abdomen is permissible, but its prolonged application may be harmful. With the gradual disappearance of the acute symptoms, the diet is increased and the morphine is gradually withdrawn. Under this plan, most cases can be safely and successfully carried through the acute stage.

Occasionally, and particularly in cases of cholecystitis associated with gall-stones, the attack is steadily progressive—empyema of the gall-bladder. The pain becomes more intense; the temperature, pulse, and leucocyte count rise steadily, and the local tenderness and rigidity become more marked. In these cases a timely operation will forestall perforation of the gall-bladder with subsequent peritonitis and a prolonged, dangerous illness.

Operative Treatment.—The operative treatment of gall-bladder disease has undergone a marked change within the past few years. At first, drainage of the gall-bladder, after removing any stones present, was the rule, and cholecystectomy was the exception. A high percentage of recurrences and unsatisfactory results, however, gradually led to the general

*Read as part of a symposium before the Staff of the McGuire Clinic, Fall, 1927.

adoption of the more radical removal of the gall-bladder as the operation of choice, reserving cholecystostomy for those cases in which prolonged drainage was essential or in which cholecystectomy was either too dangerous or impossible. Frequently the gall-bladder which most needs to come out has to be left in, because of insurmountable obstacles to its removal, either in the local conditions present, or in the patient's general state.

As a rule, then, where for good reason the gall-bladder cannot be removed, or where prolonged drainage is desirable, as in cases with an associated chronic pancreatitis, cholecystostomy is the operation of choice—in all other cases, cholecystectomy.

Where a stone has become lodged in the common duct, the duct is opened, the stone is removed and direct drainage of the duct is obtained in addition to the operation upon the gall-bladder.

The weight of surgical opinion strongly favors some form of drainage following cholecystectomy.

Sometimes, although the history and examinations have definitely implicated the gall-bladder, operation discloses one that appears almost or quite normal. Frequently removal of such an apparently innocent gall-bladder is followed by most gratifying disappearance of symptoms. However, the principle laid down by Judd in 1923 holds true in the majority of cases, namely, that the likelihood of improvement or cure following gall-bladder operations is in direct proportion to the degree of gall-bladder pathology found at operation.

Post-Operative Treatment.—Convalescence from cholecystectomy is usually more rapid than from cholecystostomy. This is in part due to the fact that cholecystostomy is done on the graver risks and on those in whom prolonged gall-bladder disease has produced such secondary changes as chronic pancreatitis and metabolic disturbances.

In the post-operative management, as in the preparation for operation, the internist renders invaluable service. This is especially true in the cases complicated by circulatory or renal disease, diabetes or other constitutional conditions.

For the first few days after operation the necessities are quiet, rest, alleviation of pain and the maintenance of body fluids. At the end of twenty-four hours, if nausea allows, liquid diet is begun. In three or four days soft diet is given, and by the end of a week a fairly liberal diet is prescribed.

In cholecystectomy the drain is usually out at the end of a week or ten days, but in cholecystostomy it is rarely removed before the end of the second week.

The stitches are removed on the ninth or tenth post-operative day, and in most of the uncomplicated cases patients are propped up in bed in from three to five weeks after operation.

During this time any tendency to hypo- or hyper-acidity is corrected by appropriate dietary and medicinal treatment, and general tonic and hygienic measures have been employed. At the same time any complicating conditions have been righted or at least controlled.

By the end of from four to six weeks, the patient is ready to be discharged from the hospital, and to receive instructions for his post-hospital convalescence.

FIELD TRAINING OF COUNTY HEALTH PERSONNEL.*

By CHARLES N. LEACH, M. D., New York, N. Y.
Rockefeller Foundation.

The development of a county health service, demanding the full time of its personnel, is a comparatively new idea in the rural sections of the United States. There is no doubt that the physician's greatest field of usefulness to the public as a whole is to be found in the realm of preventive medicine. With the development of this special branch the family physician is finding his practice dealing more and more with the prevention of disease. If he wishes to accord his patients the service that will render the greatest return he is going to be called upon to practice prevention.

Since 1914 the full-time county health unit idea has been put to the test and, as subsequent developments have adequately demonstrated, the idea has passed the experimental stage. The trained health officer, sanitary inspector and nurse have replaced the police officer in health work as the trend of public health procedure has gradually shifted. Operations dealing with environment have been extended to include preventive treatment and education of

*Read by invitation before the Virginia Public Health Association, January, 1928.

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the group and the individual. The education of the group and the individual in the prevention of disease is one of the most important factors in the new program. For its proper fulfillment there is a demand for personnel properly qualified as to education, practical training, tact and common sense. During the past ten years public health activity in the United States has shown remarkable development. The demand for health officers and nurses has greatly exceeded the supply. It has been pointed out by the medical profession, sanitarians and economists that there is a decided inadequacy of personnel and financial support of official health agencies.

The Alabama legislative body has recently increased its appropriation for health work to such an extent that it is now planned to establish a full-time health department in every county in the state regardless of population or economic status. To meet the requirements for trained personnel in connection with this program of expansion, the state health officer is now organizing a training station as a function of one of his county departments, the county health officer to act as director of the station.

Slight emphasis is placed on the teaching of preventive medicine in the majority of our medical schools in the United States, and the recent graduate knows little of the practical application of the subject. Vanderbilt University Medical School offers one of the notable exceptions. At this institution a very comprehensive course in preventive medicine is offered. This course gives the student a real insight into the application of the principles of preventive medicine with the aid of bedside clinical instruction and field work. The teachers are men who have had an extensive experience in public health administration.

We cannot look to the schools of public health for our county health officers. These post-graduate institutions are turning out men, as a rule, who are highly specialized in one branch of the subject and consequently are in demand for administrative positions in state health departments, research institutions and as teachers. The lack of opportunity for obtaining special training in public health administration and the absence of appreciation of the value of such training on the part of our governing bodies is reflected in a survey of ninety-nine cities in the United States. Of these ninety-nine cities only seven had health officers specially trained in public health administration. It is quite evident that any physician qualified for practice is not necessarily capable of serving as a county health officer, giving only a part of his time to official duties. It is desirable that this medical training should be supplemented by theoretical and practical instruction in public health work.

Five years ago the International Health Board established a training station in Covington County, Alabama, which served as a place of appraisal of prospective regular staff members to ascertain their qualifications for home and foreign service. Twenty-nine regular Rockefeller Foundation staff members have passed through this preliminary training. The value of this system of appraisal and intensive field training soon became apparent to several state health officers and at their request their newly appointed men were offered the facilities of the station. It has been the aim of those responsible for the development of the training station to emphasize practical field instruction and to stimulate an interest in rural health work. Close association with those in training has also given an opportunity to judge of their ability and actual interest in the work.

For the successful accomplishment of the training program an elaborate organization is unnecessary. A well-organized county health unit, with a competent staff, offering a diversity of public health problems fulfills the requirements for intensive field training. A state with fifteen or twenty units in operation and a prospect of organizing new units could well afford to maintain such a station. The expense of operation would add little to the normal budget of a county health unit. The returns in the way of increased efficiency and tenure of office would more than justify the small additional expense.

During the past five years 283 physicians have enrolled at the three training stations. Of those training at the Alabama station 13.6 per cent have failed to receive the approval of the director. At the Mississippi station 12.8 per cent were not recommended for service in the field of public health. The elimination of this group of failures has resulted in a financial saving to the official health agencies and perhaps the salvation of some of their county units. A disinterested incompetent health officer can very easily bring about dissatisfaction

which might result in discontinuing the work. The most common factors giving rise to unfavorable reports on these men were lack of tact and interest. If I were asked to specify the most important qualities essential to the success of a county health officer I would unhesitatingly say tact, common sense and judgment.

Medical candidates for training can usually be placed in four general classes: (1) the recent graduate who is interested only in a salaried position in order to save sufficient money to establish himself in practice; (2) the physician who has spent several unsuccessful years in practice and is anxious to make a change; (3) the health officer who has been a product of the school of hard experience, having had no training in the field of public health before attempting to direct a unit; and (4) the young graduate in medicine who ha had some instruction in preventive medicine under an inspiring teacher and has a real interest in the work. Fortunately relatively few of the candidates have been men belonging to the first two groups.

The period of training has varied from two weeks to four months. In some few instances it has been impossible for the condidate to spend more than two or three weeks in training and in those cases an appraisal of the man was all that could be hoped for. It is desirable where possible to give the man two and one-half to three months at the station. During this period no didactic work is attempted, the time being devoted to actual participation in the work of a county unit. Conferences are conducted by the directors of the various bureaus of the central administration and occasionally a visiting health official is asked to address those in training. Demonstrations are given in the methods of record keeping, graphic representation of results, sanitary surveys and the actual operation of each bureau of a state health department. A few days are spent in the field with the health nurse and sanitary inspector. This gives the candidate some idea of the interrelation of the work of the personnel of a health unit.

As a result of the increased demand for training it was found necessary, about a year ago to establish a second station. Darke County, Ohio, was selected as a favorable site and by a co-operative agreement between the local board of health, the State Department of Health and the Rockefeller Foundation the facilities of the Darke County Health Department have been made available for training or for observation. For observation purposes the health department illustrates an attempt to meet the required health work of a community of approximately 42,000 with the staff and facilities possible in a budget of approximately fifty cents per capita per year. This station affords the potential health officer an opportunity to carry out health work under supervision, to familiarize himself with the technique of the various services and with the innumerable details which are involved in such work. He learns this not by systematic instruction, for none is offered, but by actual participation in the work. Every detail of the work is open to him, and every opportunity is given him to gain the desired experience. He is thrown upon his own initiative to a large extent, and he learns much or little as he may choose. The Ohio station offers practical training in connection with county health administration and organization, budgets and budget making, the keeping of records, preparation of reports, the handling of communicable disease, graphs and graph making, epidemiological procedure, making sanitary surveys, field map making, health laws, the control of nuisances, inspection of dairies, the inspection of food handling establishments, inspection of schools, the examination of school children and all the detailed field work and record keeping of public health nursing.

Immediately following the inundation in the Mississippi Valley attention was focused on the prevention of epidemics in connection with relief measures. Those counties in the overflow area where organized full time health work had been inaugurated previously to the flood were able to meet the emergency in a much more economical and satisfactory manner than was the case where emergency organizations had to be set up by the Red Cross.

At a joint meeting of representatives of the United States Public Health Service, the American Red Cross, the Rockefeller Foundation, and state health officers from the states affected by the flood, it was decided to inaugurate an organized co-operative program for the promotion of full time county health units in the flood area. It was found that ninety-nine counties in seven states would be included in

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such a program.[1] This called for ninety-nine health officers, nurses and sanitary inspectors. In order to meet the demands for short intensive training peculiar to flood conditions a training station was established at Indianola, Mississippi. The station also performed the important function of appraising the material and weeding out the undesirable. The field training offered was much the same as that given in Alabama and Ohio and for the first time an opportunity was afforded for the training of nurses and sanitary inspectors. The Ohio station is now arranging to extend its program to include nurses and sanitary inspectors.

From the time the Station in Mississippi was established—July 8, 1927—to the middle of December, 173 physicians, nurses and sanitary inspectors enrolled at the station. They averaged a training period of 31.5 days each. They came from all sections of the United States and in a few instances from Canada.

The total number of physicians, nurses and sanitary inspectors reporting for training to the three stations during the past five years has been 448—283 physicians, 80 nurses and 75 sanitary inspectors. In addition to this number ten Harvard medical students have been given an intensive field training, receiving credit towards graduation for the work completed at the station.

Of the group of 120 physicians training at the Alabama and Mississippi stations, 16, or 13.3 per cent, failed to satisfy the requirements and were not recommended for positions. Two nurses in a group of 62, or 3.2 per cent, were no recommended, and 5 inspectors of a group of 72, 6.9 per cent, were advised to take up other work. The fact that the training of a nurse more nearly approaches the requirements of the public health nurse probably accounts for the low percentage of failures among this group; while the average physician reporting for training had little conception of the character of work required of a public health officer.

It is interesting to note that the first two physicians trained in 1922 are still engaged in the field of public health. In 1923 six health officers were trained and five are still following public health work. Among a group of fourteen trained in 1925, one has taken up other work; and five out of a group of seventeen trained in 1927 have gone into other fields. Eighty-eight per cent of this group of forty-five men whose careers we have been able to follow are still engaged in the field of preventive medicine.

An attempt was made to grade a group of sixty-nine persons who received training, dividing them into groups of "good," "fair" and "poor." The failures were included in the last group. It was found that 34.8 per cent could be included in the "good" group, 44.9 per cent as "fair," and 20.3 as "poor."

Twenty-seven states in the United States, one province in Canada, and fourteen other foreign countries have employed personnel from these stations.

While we realize that the training offered has been unsatisfactory in many respects, it is felt that it is a step in the right direction and that the time will soon come when an adequate foundation in preventive medicine will be offered by our medical schools.

61 *Broadway.*

1. About seventy of the ninety-nine counties have been organized and the work is going forward in a very satisfactory manner.

OBSERVATIONS ON RENAL INFECTION.*

By R. M. LECOMTE, M. D., Washington, D. C.

As a prelude to the study of infections of the kidney, it is well to review a few of the basic principles of disturbed sensation in the urinary organs. The kidney substance itself is poorly supplied with sensory nerves so that extensive changes may occur in it without there necessarily being any pain referred to the organ. Pain in the kidney is most certainly produced by some lesion which causes swelling of the parenchyma so that the capsule is stretched or by those lesions which interfere with the flow of urine from the kidney pelvis so that that organ becomes distended. With this type of pain producing mechanism, it will be readily seen that an infective lesion which runs an essentially chronic course may last for a long time without causing enough swelling of the parenchyma to produce pain; thus, the slowly destructive processes of tuberculosis seldom produce renal pain until they are surprisingly well established. On the other hand, an acute widespread lesion which is accompanied by marked congestion and early abscess formation will cause pain that is diagnos-

*Read before the Galen-Hippocrates Medical Society, in Washington, D. C., October 13, 1927.

tic very early. The earlier any kidney lesion is accompanied by the shedding off of bits of tissue or the production of blood clots of such a size as to interfere with the emptying of the pelvis, the earlier will kidney pain be noted by the patient. It is interesting to speculate as to whether the pain produced in blocking of the pelvis is due to distention of the fibrous capsule or to an intrinsic mechanism, but it really matters little provided it is recognized with slight intermittent obstruction; a high degree of hydronephrosis and tissue destruction may occur without any remarkable pain being noted by the patient.

Another point is with respect to the ureter. This fibro-muscular tube will cause but little disturbance of sensation unless it is required to expel some bit of solid or semi-solid material that is just a little larger than the lumen of the tube. Colic does not seem to ensue unless the musculature is thrown into spasm. This is shown in the observation of ureteral stones; a stone first noted at the uretero-pelvic junction or at the brim of the pelvis may, at the next observation, be found just above the bladder, without there having been any noteworthy colic in the interval. For the production of ureteral colic it seems necessary that the contractions of the segments be thrown into disorder, for, if the lumen is filled from end to end with a homogeneous mass of uniform pasty consistency, such as pus or fresh blood clot, the musculature may expel it in jets, as it normally does urine, without inducing any pain; on the other hand, a small stone or bit of tissue may produce terrific colic.

A third point is that, although direct sensory fibres are few, the kidney and ureter possess a sympathetic innervation that is admirably adapted to the production of reflexes both sensory and motor—what vegetative neurologists call visceromotor and viscerosensory reflexes. The kidney and ureter are supplied with sympathetic fibres extending from the sixth dorsal to the fourth lumbar spinal segments of the cord. These spinal segments also give off sympathetic filaments to important parts of the gastro-intestinal canal and genital organs and supply filaments of common sensation to skin segments extending from just below the nipple to the lower part of the leg. It is for this reason that gastro-intestinal and bladder disturbances are common in kidney and ureteral disease. Bladder disturbances are particularly common and, apart from actual inflammation of that organ, are apt to manifest themselves as painful frequent urination or as a constant imperious desire to void.

In kidney infections, then, disturbed sensations may manifest themselves as dull, heavy lumbar ache if the kidney is involved, and by an associated or dissociated similar pain opposite the ninth chondrocostal junction anteriorly when the pelvis is distended; by the sharp abdominal cramp of ureteral colic and by sensory or motor reflexes in organs apart from the primary disease. Combinations of these three types occur and afford an infinite variety of clinical pictures.

It is characteristic of genito-urinary diseases that they are frequently complicated so that the presence of a readily demonstrable lesion in the lower tract frequently points to infection elsewhere,—a cystitis may be based on a kidney lesion, or an epididymitis on a prostatitis; in fact, if a lower tract lesion does not readily clear up under proper treatment, it rather points to a complicating focus of infection elsewhere. The presence of pus in the urine should be looked upon as an indication of renal infection unless some other perfectly obvious and simpler cause for it is evident, and when other adequate causes do exit, the kidney should be ruled out if a reasonable amount of treatment to the obvious focus does not clear up or greatly improve the pyuria.

Before the use of the cystoscope and ureteral catheter became general, clinicians believed that kidney infections invariably arose by extension upward from the bladder: they were led to this belief because most patients in whom definite renal infection was demonstrated, had previously suffered from cystitis. Nowadays it is recognized that the kidney infection is primarily a blood borne condition and the accompanying cystitis secondary. Some think that the excretion of living pathogenic bacteria is a function of the normal kidney, that it occurs constantly in the daily life of normal individuals and that only under exceptional circumstances does the kidney become infected by the bacteria passing through it.

Once established and proliferating in the kidney tissue, the bacteria set up an inflammatory reaction in that organ. This inflammation is accompanied by tissue destruction and abscess formation, and, if conditions are favorable, the exudate in the inflamed area may be

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absorbed, scar tissue form and no persistent or really important infection result. Under other less favorable conditions, instead of healing by absorption and replacement by scar tissue, the dead material may be taken care of by the deposition of crystals that are more or less rich in calcium, and stone formation result. In still other instances, the abscess enlarges and breaks either through the cortex, when it results in some type of perinephritis, or into the pelvis, whence the pus is discharged in the urine. This last termination interests us particularly because it is then that kidney infection as it is commonly met results.

When this termination occurs, the tissues of the pelvis and ureter of the affected organ also participate in the inflammation and a true pyelonephritis is present. The mucous, submucous and muscular coats are involved and, after healing, their elastic and contractile properties are impaired more or less, depending on the type, extent and duration of the infection. Sometimes the pelvis is extensively altered, sometimes the ureter, but in either event the functional impairment is proportionate to the anatomical damage, and it brings about a definite hindrance to the escape of the urine secreted by the kidney above. Any impediment to the free egress of urine is followed by lowered resistance to infection in the organs situated above the impediment, so that, if material damage has been done to the pelvis or ureter, a vicious circle, which favors recurrence of or persistence of infection is established. Thus, it is evident that, if the process is not controlled early, an infection that was simple in the beginning may persist for a long time and lead to wide-spread damage in the organs involved.

Painful, frequent urination is apt to have a prominent part in the clinical picture presented by acute renal infection, and, in chronic cases, careful questioning will generally ellicit a history of short intense attacks of frequent urination or of nocturia of mild grade lasting over considerable periods of time. When frequent urination persists for long, even if no pus is found in the catheterized specimens, cultures should be resorted to, and, if they are repeatedly positive, the field of examination should be extended to include cultures of specimens obtained from the kidneys by ureteral catheterization. With the finding of pus in a catheterized specimen, the indication for a complete urological examination is clear and this should include an X-ray study with catheters *in situ*. Unless the diagnosis is obvious without it or there is some contraindication to its use, pyelograph should be done; its routine use will give great help in establishing a prognosis and will frequently elaborate the disease picture in many important respects. Functional tests should be used before any operative interference is carried out and they may be extended with benefit to all cases. All methods employed at present are open to some fallacies, and too rigid reliance on them may cloud rather than clear the issue at stake. Since successful treatment is predicated on an accurate diagnosis, it may be necessary to repeat examinations, and this should be done without reserve whenever all points do not check to the same end.

Treatment must include a search for and eradication of such foci of infection as may be present. Foci in the head are particularly common. Dentists are loath to remove dead teeth unless periapical abscesses are shown in the X-ray; but, since cultural methods have shown all devitalized teeth to be infected, the physician should not scruple to over-rule the dentist's objection to their removal. Treatment of infected root canals without the removal of the body and crown of the tooth is too uncertain to be considered when such an important organ as the kidney may be at stake. In addition to teeth and tonsils, the gastro-intestinal canal must be investigated and, in the genital sphere, the prostate in men and cervix in women.

Given a case of acute infection with fever and other signs of generalized infection, it is permissible to treat the patient by rest, bland diet, forcing fluids and the administration of urinary antiseptics for a few days. Some cases will clear up clinically and occasionally the pyuria disappear under this regime, but these are the exception, and the results of pelvic lavage are so uniformily beneficial that it should be undertaken at the earliest possible moment. If evident ureteral obstruction is present, ureteral catheterization should be done at once for the purpose of relieving the back pressure as well as combating the infection. Needless to mention, appropriate treatment should be given ureteral stones and strictures and other obstructing factors, such as uterine fibroids and inflamed seminal vesicles. Lavage

should be persisted in until the patient is free from clinical symptoms and the bladder urine negative for pus for at least one month.

Conclusions.

Infections of the kidney may present such vague symptoms and signs that the clinical picture may give no hint as to the nature of the disorder. Vague abdominal pains and frequent urination may be the only leading symptoms in renal infection.

All cases in which pus is found in the catheterized specimen should be submitted to a complete urological examination. This should include an X-ray study of the entire tract with the catheters in the ureters. Pyelography is necessary in a large proportion of cases to determine the amount of distention of the ureter and kidney pelvis and to delineate unsuspected anomalies or neoplasms.

In cases not complicated by obstruction or stone, pelvic lavage frequently cures the infection and, in cases complicated as noted above, furnishes an invaluable method of lessening the infection and bringing the patient to an improved status for whatever operative intervention may be necessary.

1801 *Eye Street, N. W.*

PRENATAL CARE.*

By EUGENE L. LOWENBERG, M. D., B. S., Norfolk, Va.

It is my purpose tonight to emphasize the "Preventive Medicine" of obstetrics, the modern prenatal care which has been so largely responsible for the reduction in infant and maternal mortality and morbidity. Pregnancy being a physiological function, we still do not understand clearly why the pregnant state carries with it the liability to certain major and minor complications, but we have learned that by months of wary watching, of advice and supervision, we can terminate the average case happily, with the mother unharmed and a healthy infant.

Already has the public caught on to the merit of the new order of things and mothers engage us early, expect to be questioned carefully and completely examined.

I shall not dwell at length on the initial history and physical examination. The former should be as inclusive as any medical record. Affections which may have impaired the mother for labor—heart disease, chronic kidney disease, tuberculosis, nervous disorder, hyperthyroidism, are of especial importance. In multiparae, in the history of the previous pregnancies, the duration of gestation, presence or absence of toxic symptoms, unusual presentations, hours in labor, dry labor, weight of child, spontaneous or instrumental deliveries, give us an idea what to expect in the present labor. Any spotting after the last regular menstruation should be noted. Similarly, the physical examination should be a complete one. In pregnancy, in addition to external and internal pelvimetry, the vaginal examination, and the obstetrical examination of the abdomen, we are particularly interested in (1) the general skeletal make up; (2) the teeth, because of their tendency to decay at this time, and because of the possible relation of focal infection to the toxemias or pyelitis of pregnancy; (3) the nipples; (4) the thyroid gland, and (5) the legs with special reference to varicosities and edema.

With an estimation of the blood pressure, a complete urine analysis, hemoglobin estimation, weight determination, blood Wassermann, and vaginal smear, we feel we know our patient and already have a firm foundation for the visualization of her confinement.

After indicating the date of confinement, which, by the way, may be off by one to three weeks according to whether conception took place just before or just after the last menstruation, one proceeds to advise the mother as regards, (1) diet and general hygiene; (2) care of the commoner non-serious complications or accompaniments of pregnancy; (3) symptoms of the more serious complications, the occurrence of which you wish to be notified; (4) as to future consultations, and (5) the arrangements for a nurse, and preparations for confinement.

In the early months of pregnancy, no modification in diet is necessary unless the mother has unusually vicious habits, as kidney complications rarely occur till after the fifth month. After the seventh month every patient should be on an anti-nephritic diet. The dietary conditions which must be observed more particularly are, first, abundant supply of carbohydrates, calcium and vitamins; second, restriction of foodstuffs likely to upset digestion, or to throw added strain on the kidneys.

*Read before the Norfolk County Medical Society.

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Foodstuffs permitted and to be encouraged are:

Starchy foods: Bread, potatoes, rice, noodles, cereals, corn.

Fruits: Grape-fruit, oranges, apples, pears, plums.

Green vegetables: Spinach, lettuce, celery, green peas.

Fowl: Chicken, squab, porridge, and lighter meats, as lamb chops, bacon, ham.

Fluids: Water, milk, cocoa, lemonade, weak tea. Water is the best guardian of the kidneys at any time, and in pregnancy assumes a position of paramount importance. Eight to ten glasses should be taken daily, best between meals.

Restricted or prohibited are:

Meats: Red meats, fish, beef-tea, beef soup. One meat meal a day is ofttimes permissible.

Eggs: Best restricted to one egg a day, boiled or poached.

Rich and highly seasoned foods,—pastry, welch-rabbit, lobster, fancy desserts.

Condiments: Radishes, Worchester sauce, pickles, pepper, etc.

Fried foods: Fried potatoes, eggs, greasy fried meats.

Vegetables with a strong volatile oil (strong odor), onions, cabbage, cauliflower, turnips, raw pineapple, acid berries, alcohol, strong tea, coffee.

The mother need not eat more than she is accustomed to. On the contrary, over-eating is a common cause of toxemia of pregnancy.

Foodstuffs rich in calcium, such as asparagus, spinach, banana, egg, cow's milk, must be taken abundantly during this period to make up for the added demand for this element occasioned by the growing fetus. A dietary insufficient in calcium not only predisposes to decay of the teeth, but likewise is believed to predispose to a low blood calcium in the infant, with the resultant tendency to infantile spasmophilia.

Particularly important in the hygiene of the mother in pregnancy are (1) reassurance, avoidance of worry or mental excitement; (2) attention to the teeth and tonsils—a competent dentist should be seen early; (3) protection of the kidneys by diet, as above; (4) avoidance of exposure, and activation of the skin by daily warm baths. Exercise is necessary, should be taken in the sunlight and the fresh air, and should consist chiefly of walks, well within the limits of fatigue. Any exercise implying the possibility of a jolt is prohibited, such as running up and down stairs, tennis, horse-back riding, automobiling over rough roads, railroad journeys. Dancing and golf are permissible till the later months of pregnancy. Where the patient is accustomed to it, careful sea-bathing does not harm, but if the water is rough, may bring on a miscarriage. Standing about increases the tendency to varicose veins and aching of limbs and the mother should be warned against this. Close and stuffy rooms, theatres and late hours should be avoided.

As regards work, the ordinary household duties may be continued throughout pregnancy, but any work which puts a strain on the abdominal muscles is prohibited—i. e., lifting heavy objects, stretching to hang up washing.

The skin does much to help the kidneys in the way of elimination and should, as mentioned above, be kept active by a daily warm bath. Turkish baths, cold baths, hot sitz baths are prohibited. Over-use of the eyes is to be warned against. The nipples should be prepared for nursing by daily cleaning with a rough cloth, soap and water, and an occasional application of mineral oil. In the latter months of pregnancy, applications of compound tincture of benzoin are made if this treatment has not toughened the nipples, and if they are retracted they should be gently tugged at in an effort to make them more erect.

Nothing should be worn that forms a band around the waist or restricts the circulation in the legs. Clothes should hang from the shoulders, circular garters should be discarded for ones attached to the underwear. If corsets have not been worn previously, they need not be now, but a woman who has been accustomed to one had better continue to do so to support her back, loosening the same about mid-term and substituting a special maternity belt in the later months. Clothing over the breasts should be loose, that the nipples may not be pressed in. Pendulous breasts may be supported by a light binder, and in multiparae with lax abdominal walls, in whom the uterus tends to sag forward and backache is complained of, an abdominal belt may be worn (being directed to the lower part of the abdominal cavity). The pregnant woman has to walk with a slight lordosis to maintain her

balance. Elevation of the heels makes this worse. The shoes, therefore, should be broad and with low heels. The added weight the mother has to carry causes a tendency to flat feet, so that she should be warned to stay off her feet as much as possible, and arch supporters should be prescribed when indicated. Douches are to be avoided unless given under direction of the doctor for a specific need. Coitus during pregnancy predisposes to miscarriage and to puerperal sepsis and is best withheld, certainly after the seventh month.

Morning sickness, constipation, and sleeplessness are common concomitants of pregnancy. The vomiting of early pregnancy is often central; therefore, suggestion or psychotherapy is of great value. A light breakfast of tea and toast taken in bed before the patient has even sat up in the A. M., and an increase in the carbohydrates in the diet is frequently curative. More severe cases, not including hyperemesis gravidarum, are sometimes relieved by organotherapy, such as corpus luteum, one ampoule three times a week to twice a day, or intravenously, if necessary, as advised by Hirst; or the placenta compound of Harrower; by alkali therapy in the form of an alkaline powder or the A. B. C. mixture, potassium acetate, potassium citrate, potassium bitartrate, grains ten of each. Reflex causes, such as a retro-flexed uterus or erosion of the cervix, should be removed. The administration of large doses of sedatives, such as bromides or luminal is helpful. A gastric lavage with 5 per cent soda solution, followed by the injection of a couple of ounces of Epsom salts through the stomach tube, large doses of bromides (60 grains) alternating with glucose, and soda per rectum every 6 hours, glucose 10 to 20 grams in 50 per cent or more diluted solution, intravenously, with or without insulin (one unit to three grams glucose), will control most cases of hyperemesis gravidarum. It is well to remember that poor teeth and oral sepsis may increase the gastric distress of this period.

Toxic absorption from the colon affecting the system in general and the kidneys in particular, and sluggishness of the bowels are to be rigidly avoided. Much can be done by emphasizing the necessity of going to the stool at a regular time each day, by increasing the fruits and green vegetables in the diet, by forcing fluids and having the patient drink an extra glass of warm water on arising in the morning and on going to bed at night. A good plan is to give mineral oil, one tablespoonful, after each meal with a dose of a stronger cathartic such as cascara at night. Leave off the cascara the next day and on the next reduce the mineral oil to twice a day, and then gradually discontinue it entirely. Where tenesmus exists, a glycerine suppository may help, or a rectal injection of 6 ounces of warm olive oil, to be retained over night. Useful laxatives in pregnancy are cascara, milk of magnesia, liquid petrolatum, Pluto water, phenolax, occasionally citrate of magnesia. Castor oil, calomel, Epsom salts, enemata, are to be avoided.

For sleeplessness, main reliance should be placed on fresh air, exercise, suggestion. Sodium bromide, grs. xv, t. i. d., with a double dose at night, is very useful.

Assuring the patient that you mention the untoward symptoms only because, by taking proper care of the same, real complications can be avoided, the physician requests that he be notified should there develop severe headache, spots before the eyes, swelling of the feet or eyelids, precordial pain, excessive vomiting, reduction in the output of urine or an increase in its concentration, vaginal bleeding, or profuse vaginal discharge. In the latter months of pregnancy, the size and weight of the gravid uterus may cause discomfort and lead to fatigue on slight exertion, shortness of breath, bearing down, backache, aching in the groins and legs. Such symptoms do not mean an untimely end of labor, and the patient should be reassured. Where possible, the patient should be given a pamphlet or some other written form containing a resumé of your instructions and a list of the articles needed for the confinement.

The greater part of the physician's supervision of the mother during pregnancy is done through routine antepartum visits, and it is by information thus obtained that he is able to forestall many complications of pregnancy and guide pregnancy to a timely and happy termination. The patient is to return every three weeks up to seven months and every two weeks thereafter, and more often when indicated. If the patient fails to show up, it is the physician's duty to send a card reminding her. The patient is weighed, blood pressure taken, urine examined, height of fundus

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estimated, questions put as to possible complications, and should these have arisen, with proper explanation to the patient to avoid frightening her, appropriate treatment instituted. Moderate hypertrophy of the thyroid is a fairly common concomitant of pregnancy, but is usually transient or disappears after delivery. This goitre of pregnancy is a hyperplastic or a colloid goitre similar to that which develops at puberty, and as such may be presumed to be associated with an iodine deficiency. Whether or not to give iodine during this antepartum complication is, however, still controversial. Many obstetricians advocate its use both as a prophylactic and therapeutic measure for the mother and as a prophylaxic against congenital goitre in the child. Two grains of sodium iodide may be given once or twice daily.

Any vaginal bleeding after the first few months of pregnancy must be looked upon with suspicion. Continuous spotting may be the first indication of placenta previa. Threatened abortion calls for a week to ten days in bed after bleeding has stopped.

On the prenatal visit of the fifth month, examination should be made to determine if the uterus has risen out of the pelvis. Incarceration of the retroflexed uterus is a not uncommon cause of miscarriage.

Syphilis in the mother calls for energetic treatment as soon as it is discovered. Treatment begun even as late as the seventh month may lessen the chances of the infant having the disease.

A pregnant woman seems to have a lower blood pressure than before she was in the pregnant state. The blood pressure of the antepartum woman is thus generally low—110-100 systolic, 60-70 diastolic. A systolic pressure of over 130 may be considered abnormal and should indicate further interrogation of the patient and a consideration of the other signs of impending toxemia—headache, dizziness, edema, albumen, visual changes, gastric disturbances. A rise of 10 or 15 degrees, even though it only means a systolic of 115 in a patient formerly having a systolic of 100, is significant. The blood pressure is one of the most important indices of approaching toxemia. In the same way, albumen present, where formerly absent, or increasing in a short interval of time, may have grave import. Increased concentration of urine (high specific gravity) may indicate insufficient intake of fluids, or, more significantly, the presence of pus in the urine, as in pyelitis. A determination of the total 24-hour output may give evidence of grave kidney impairment. Sugar in the urine of a pregnant woman usually is lactose (due to mammary secretion) but tests to exclude glucose should be performed. The weight is an important means of telling whether the mother is in metabolic balance while carrying the foetus. A slight loss is to be expected in the early months, but in the latter half of pregnancy 10 to 15 pounds should be gained (about two pounds per month). A rapid loss or a rapid gain is abnormal. A normal increase in weight indicates a sufficient dietary.

Personally I believe that the size of the child can be influenced in some cases by restricting the diet of the mother and, in any event, feel that unusual gain in weight calls for reduction in total caloric intake.

Throughout this period almost preternatural significance should be attached to the slightest abnormal symptom or sign. In this way, one begins to treat the possible complication before it has actually arisen. A slight increase in albumen, or a small but real rise in blood pressure calls for instructions to the patient,—rest, greater restriction in diet, increased intake of fluid, attention to bowels, and a reexamination in a few days. And should more definite signs of impending toxemia arise, the patient should be put to bed, hospitalized, and treated as a sick woman—with a diet of milk and fruit juices with sugar, Epsom salts daily, diuresis with a salt such as potassium citrate or ammonium chloride, colonic irrigations—before she is really sick.

If the blood pressure does not fall and the other symptoms or signs clear up under such treatment, the patient should be carefully studied. Kidney functional test, complete blood chemistry, including plasma CO_2 urinary acetone, and liver functional tests are in order that treatment may be based on rational lines, according to the degree of acidosis, of true nephritis, and of eclamptic manifestations. Acidosis may be relieved by glucose intravenously. Sweating, a saline diuretic, and large amounts of water by clysis, per rectum and intravenously as a 10 per cent glucose solution, promote the action of the kidneys. The Strogonoff treatment seems the

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most popular for true eclampsia. Magnesium sulphate, long used as a decongestive and a central nervous system sedative to control the convulsions of tetanus, has recently been used with remarkable success to control the symptoms of preclamptic toxemia and the convulsions of true eclampsia. Twenty c.c. of a 10 per cent solution is given intravenously, repeated in an hour if necessary. Should there be any undue respiratory depression from this, the antidote—calcium chloride, 5 c.c. of a 10 per cent solution, is given intravenously.

About six weeks before the expected date of confinement there should be a prenatal visit, preferably at the home of the patient. As on former visits, interrogations as to symptoms of complications are put, urine examined, blood pressure taken, and the matter of diet, bowels, fluid intake, and general hygiene again emphasized. The heart might well be re-examined at this stage. Obstetrical examination of the abdomen is repeated, and the duration of pregnancy confirmed by the height of the fundus and date of quickening; also, the position, presentations, degree of engagement are determined. The foetal heart is counted, the size of the baby estimated. A vaginal examination should be done, the presentation and position confirmed, abnormalities sought for, and internal pelvimetry repeated. Internal examination at this time is especially important where external pelvimetry has given border-line measurements, and should be carried out with aseptic precautions; the nearer to term, the greater is the need for caution and the more inadvisable the examination. Near term rectal examination should replace vaginal examination where possible. The physician should visualize the labor, and plan to handle any abnormality that may exist.

At this visit it is well to spend considerable time carefully instructing the mother in the care of the new-born child.—the care of the navel, the time and duration of feedings, the care of the bowels, etc. The importance of breast feedings both for the baby and the mother should be explained and emphasized. The symptoms of on-setting labor are described. The mother is warned against tub baths from now on. She is given plain instructions as to how the doctor may be quickly reached and what to do till he arrives. The preparations for confinement are again gone over, the nurse engaged and instructed as to what you expect of her.

And the patient should go into labor clean, with pubic hairs shaved, bowel and bladder empty, and aseptic precautions taken.

Exercising prenatal care as outlined above, the physician has many opportunities and many means of decreasing the dangers of pregnancy both for the mother and the child. He early discovers such lesions on the part of the mother as call for the induction of abortion, as severe mitral diseases of the heart, advanced tuberculosis, or Graves' disease; he replaces the gravid retro-flexed uterus before incarceration occurs; he forestalls the toxemias of pregnancy, eclampsia; he discovers early and treats syphilis in the mother, reducing the chances of the foetus having the disease; he advises the mother how to avoid accidents causing abortion or premature delivery; he is watchful for premature separation of the placenta, discovers placenta previa early, and is prepared to handle same; he detects early abnormal presentations, such as breech, and converts them where possible; he anticipates disproportion between head and outlet, contracted pelves, and has a program mapped out for the handling of same—trial labor or elective cesarean section; he reduces the opportunities for puerperal sepsis to a minimum.

Sociologically, prenatal care is of vast importance. About 25,000 women die annually in the United States from child-birth. 100,000 babies are born dead, and 100,000 more die within a few days after birth. It is probable that this maternal and fetal mortality could be reduced to half by proper ante-partum care. Social workers could do much towards bringing the poor and uneducated into the care of well-run clinics Physicians must emphasize the need of such care to their patients from early pregnancy. The need for more ante-partum clinics, education of the laymen, and maternity centres is apparent. For the mother, for the physician, for the people at large, prenatal care is thus an all important phase of medical work.

Medical Arts Building.

THE CO-OPERATION OF THE ATTENDING PHYSICIAN.*

By WADE MILES, Esq., Bristol, Va.

Deputy Commissioner, State Industrial Commission.

The necessity of full and free co-operation of the attending physician with the Commis-

*Read by invitation before the Wise County and Norton (Va.) Medical Societies in Norton, February 24, 1928.

sion in the administration of the compensation law will be admitted by all, and the purpose of my discussion will be to acquaint the physician with the application of his service to such proper administration, from the standpoint of the Commission.

The Law Requires.

The statute requires the employer to furnish such necessary medical, hospital and surgical attention to the injured employee as the nature of his case may reasonably indicate, for a period of sixty days, which services may be continued for a longer period, optional with the employer.

Manifestly, if the employer is to pay compensation in all cases of injury, and is bound to furnish proper medical, hospital and surgical treatment, he should be given a reasonable opportunity to ascertain what the injuries are, their probable extent and duration, and to keep himself so informed throughout the period of payment, and to select the person or persons and instrumentalities to furnish such service, and the law so provides.

On the other hand, the law requires that the injured shall accept such service; and, of course, if an injured is required to accept the services of a physician of another's selection, the person so selected must be reasonably skilled in the service he is to perform.

Rights and Duties of Physicians.

If the physician which employer selects prematurely discharges the employee as cured, and the employee secures further treatment, the employer must stand the expense thereof, provided it is within the statutory period. The employer is responsible for a mistaken diagnosis of the case by its own physician.

When the employer's physician in charge of an injured employee, not desiring to assume sole responsibility of treating a grave injury, acquiesces in the calling in consultation of another physician, the necessity of such assistance is presumed, and the reasonable cost thereof should be borne by the employer.

It is within the province of a physician placed in charge by the employer to make all necessary arrangements for such treatment, consultation, and assistance as in his judgment are reasonably required to cure and relieve the patient from the effect of the injury, and the expenses thereof are properly chargeable to the employer.

The employer is only liable for the reasonable costs of such treatment to the employees; therefore, the charges of the physician should be limited to such charges as prevail in the same community for similar treatment of injured persons of a like standard of living when such treatment is paid for by the injured person, and not increased because it is the employer who must pay. In other words, the reasonableness of a charge depends on the position of the average employee, not on the position of the particular man treated or the financial condition of the employer.

Employer Must Provide and Injured Employee Must Accept Medical Attention.

If the employer refuses to give such attention, the injured may secure such service himself at the expense of the employer. If the injured refuses to accept such attention, no compensation shall be paid during the period of such refusal, unless such refusal was justified.

We have had instances where the injured refused to permit a physician to attend him. Other refusals are:

(1) Refusal to go to the hospital.

(2) Refusal to submit to operation.

(3) Refusal to co-operate with the attending physician in the way of carrying out in a reasonable way the instructions of the physician.

(4) Refusal to report for examinations, by specialists, diagnosticians, etc.

In all cases, the questions of whether or not the injured did refuse, and, if so, whether such refusal was justified, are questions of fact to be determined by the Commission; and it is the duty of the attending physician upon such refusal immediately to notify the Commission, in order that it may take such action as may be necessary to remedy the situation. This is a duty that the physician not only owes to the Commission, but jointly owes to the employer and employee. For, one or the other's rights may be prejudiced seriously. (It would be well to state in this notification the necessity for the proferred treatment, and the reasons given by the injured for his alleged refusal to accept).

In this connection, the law requires that employee "shall accept an attending physician," and it is his duty

(1) To go to the hospital when advised to do so by such physician;

(2) To submit to such reasonable operative treatment as may be advised by skilled surgeons;

(3) To co-operate with the attending physician and reasonably carry out his instructions;

(4) To report for such examinations, either to the attending physician, or to specialists and diagnosticians, as in the opinion of the attending physician may be necessary.

On the question of the employee submitting to operations, the Commission has held that where the evidence is satisfying good results and most likely a complete cure may be effected by resorting to an operation that is unattended with danger, that it is the duty of the employee to submit to such operation, provided it is such an operation as an ordinary prudent and courageous person would submit to for his own benefit and comfort where no question of compensation was involved.

The effect of the refusal to accept medical attention is also a question of fact to be determined by the Commission. An employee can not be charged with any greater part of his disability than that which was caused by his failure to accept the treatment.

Hospital and Medical Attention is Part of Compensation.

The hospital and medical attention required by the statute is a part of the compensation to be paid by the employer to the employee. This includes dental bills where the replacement of teeth constitutes a necessary part of the curative treatment; nurse bills, where such attention is reasonably necessary and ordered by the physician; the reasonable expenses of the employee in going to and from the places of treatment and his reasonable expenses while away from home receiving such treatment.

Special Attention.

The employer is liable for special attention given the injured, and the results thereof, as well as the cost of same. And, if, as a result of the special treatment, death or greater disability results, the employee's compensation will be adjusted accordingly.

Physicians' Opinions on Extent of Disability.

There is another service for which the physician is called upon which is very important to the Commission in the proper and equitable administration of this law, and that is his evidence before the Commission in the nature of expert opinion on the various questions constantly arising in the trial of cases.

There are a number of degrees of disability. Usually, following an injury of any consequence, there is a period of temporary total disability, followed by a period of temporary partial disability; or, temporary total disability followed by permanent partial disability; or, temporary total disability followed by some specific loss of use of a member. In addition, we have the complete and permanent disability cases, facial disfigurement, the hernia, the traumatic diseases, such as pneumonia and appendicitis, and the aggravation by injury of a pre-existing condition.

It is not as difficult for the Commission to determine when temporary total disability ends and the partial disability begins, or even when the partial disability ends, as it is to mete out uniformly the percentage of the loss of use of a member when its usefulness is partially lost by reason of the injury. For, there is no absolute and scientific way of arriving at this percentage. It is a guess the best we can do. However, the Commission has determined that those who are most likely to guess correctly, in addition to the injured himself, are the physicians. These estimates widely vary in some instances. In order to make these estimates uniform and the awards for partial losses of use the same in every section of the State, we believe that it is well for the examining physician to state, in making his estimate in percentage, the conditions which he finds causing the loss of use, and then after all the evidence is in, that we use our experience with the particular case in comparison with other similar cases, and fix the percentage of loss of use, although in doing so it may sometimes become necessary, in our judgment, to lower or to increase the estimate made by the physician.

So, in fixing the extent of the disabilities in these cases the examining physicians should, and they do, exercise a great deal of care. The Commission, to a large extent, has to rely upon their judgment, and their opinions on such questions are almost conclusive upon the Commission. Each one of you in a measure holds the reputation of the other in his hand. Especially is this true as concerns the injured employees.

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Daniel Webster once said that the Ten Commandments, the Golden Rule, and the Law of Love were a part of the Common Law of the land, and the physicians and employers and employees who act in the spirit of this law can and will arrive, in their several industries and occupations, at adjustments which will prove to the mutual good and best results to all, and at the same time help the Commission solve its problems in adjusting the burdens of the cost of compensation equitably upon economic principles.

Somewhere in France there is a monument to Pasteur, on which is a brief inscription in French, which is most impressive. It may be rendered freely in this way: "To cure sometimes; to relieve often; to comfort always."

This is rather a fine summary of the opportunity of the physician.

In conclusion, let me state that the co-operation of the physician in the administration of the Workmen's Compensation Law is worthy of commendation.

INTESTINAL STASIS—FUNCTIONAL TYPES.*

By MORRIS I. BIERMAN, B. S., M. D., Washington, D. C.

One would hesitate to assign constipation a place of prominence in the family of human ailments. Yet the relief of this relatively benign condition has had a place of first importance in therapeutics for many thousands of years. Even today there is undoubtedly more medical advice given for the relief of constipation than for any other ailment. This is partly due to tradition amongst the masses that all therapeutics must commence with a drastic cathartic.

Secondly, but not of less importance, is the empirical fact that activation of the bowels does relieve many obscure clinical syndromes.

Yet experimental proof has been brought to show that the mechanical distention of the rectum with cotton will produce all the so-called "toxic" manifestations of constipation. Furthermore, we are all familiar with that peculiar sense of well-being which the chronically constipated individual experiences immediately after a satisfactory evacuation, at which time there can have been no lessening in the amount of the absorbed material. Case histories have been reported in which the intervals between bowel movements have been days, weeks, and even months without untoward symptoms.

On the other hand, it has been found through X-ray studies that many individuals complain of symptoms similar to, or even identical with, those which we attribute to constipation, yet do not at any time have their rectums distended with impacted fecal material. In other words, the intestinal stasis is not in the rectum, but at some other point, or points in the intestinal tract.

Experimental proof and clinical experience have shown, beyond any question of a doubt, that obstruction or delay of the intestinal contents in the small bowel will give rise to alarming symptoms. And, as a general rule, the higher the obstruction, the more severe the symptoms.

There is, however, a point in the small bowel at which intestinal stasis becomes a condition of somewhat minor importance, that is, one not directly endangering life—the terminal portion of the ileum. When the stomach is low and hypotonic, when the colon is ptosed, when the body-tone is relaxed, in a word, when the patient is a victim of visceroptosis, the terminal ileum and the ileocecal sphincter may partake of the general muscular relaxation. As a consequence, the intestinal contents are but feebly propelled by the ileum into the cecum. The intracecal pressure, in turn, produces regurgitation through the relaxed ileocecal valve. This duplicity of mechanisms results in definite stasis in the terminal portion of the small bowel. Frequent nausea and occasional vomiting are forceful reminders that stasis here is harmful. This type of constipation can be permanently relieved only by restoring the normal body tone, leading in turn to greater efficiency of the ileum and ileocecal sphincter. The forced feeding of large amounts of food in the accepted treatment of visceroptosis helps restore the normal tone of the intestinal muscle, and is reflected in the better evacuation of the ileal contents. Mild intestinal stimulants will also aid in restoring the normal intestinal tone.

Cecal Stasis.—The development and mechanics of the cecum and ascending colon are such as to favor the retention here of the intestinal contents for a longer period of time than any other portion of the gastro-intestinal tract. Cecal peristalsis is at best very poor, probably for the purpose of further absorption of liquids with their dissolved nutritious

*Read before the Gastro-Enterological Section of the American Medical Association, May 18, 1927.

particles. But what has been intended for a physiological process for the good of the individual, may, by a little overdoing, become pathological, and stasis result. The increased intracecal pressure favors cecal distention and atony, and symptoms resembling mild chronic appendicitis may appear. The pains may be due to the distention of the cecum, or to the dragging on the cecum by the increased amount of material. The complete evacuation of the cecal contents can be obtained only by drastic catharsis. But as the condition is a chronic one, dietetic treatment with mild stimulatory catharsis will undoubtedly be more satisfactory.

Fig. 1.—Markedly spastic colon showing irregularity of haustrations.

Spastic Constipation.—Keith has claimed that "in the great majority of those cases which are classified under the somewhat elastic term of 'intestinal stasis,' the symptoms do not result from atony of the musculature of the bowel, but from a hypertonicity of those parts which are normally in a state of tonic contraction." Alvarez has shown that each section of the bowel has its own normal gradient, that is, its own normal response to stimulation. He has also shown that, when a section of the bowel for any reason becomes more sensitive to stimuli than normal for that region, and the response to the stimulus is greater than the gradient on either side of the point stimulated, the peristaltic waves will travel in both directions, much as the ripples caused by a thrown stone will travel both up and down stream. Just such a condition occurs in the large bowel. The cause is obscure, but frequently the transverse and descending colons become very spastic, and this spasticity may assume such proportions as to impede the forward progress of the intestinal contents. And I have even observed retrogressive movements of the intestinal contents, where the ascending colon was already empty one day, and again partly filled the next. The cecum seems to enter but little into the condition. This type of constipation occurs most frequently in well nourished individuals, and is characterized by attacks of severe intestinal pain, tenderness on pressure over the colon, and even vomiting. The patient complains of "gas," and the barium meal seems to aggravate the condition. It is very frequent to find that on the second day of a routine gastro-intestinal examination the patient complains of having had one of his worst attacks the previous night. Attacks such as these may even require morphine for their alleviation. The relief of this type of constipation has been admirably worked out by Dr. Alvarez in what he calls his "smooth diet." This diet has no roughage whatever, and is very concentrated, so that stimulation of the intestine is at a minimum. An antispasmodic such as belladonna will also aid in overcoming the colonic spasticity.

Atonic Constipation.—There is another type of constipation which is in direct contrast to the type just discussed. Instead of the colon being abnormally sensitive to stimuli, for some unknown reason its threshold of response has been considerably increased. Due to this blunting of its sensitiveness to stimuli, the large intestine does not contract firmly upon its contents, and consequently the intestinal motility is diminished. A definite clinical syndrome appears to be wanting, and the patient's complaints are quite vague, pointing to no specific organ. The condition is most frequently seen in the asthenic type of individual. In contradistinction to the spastic type of constipation, stimulation is necessary. Bulk is one of the best intestinal stimulants, yet bulk is already present without avail, so that stimulation from without must be considered. Cascara, senna, and the like will be found quite beneficial because of their direct action on the colonic musculature.

Dyschesia.—And, finally, we come to a still different type of constipation,—one in which there is really no abnormality of the intestinal

tract at all. The difficulty lies entirely within the rectum itself. Many people through embarrassment, preoccupation, or indifference, delay evacuation of the bowels until a more favorable time. This neglect in emptying the rectum leads to blunting of its sensitiveness and atony of its musculature. As a consequence, the voluntary muscles that assist in defecation also become weak, and when defecation does take place, only part of the rectal contents are discharged. Thus, we see the strange phenomenon of a normal gastro-intestinal tract, with normal movements of intestinal contents, and yet severe, obstinate constipation. Moderate degrees of this condition are met with daily in routine gastro-intestinal examinations. Purgatives will not aid in overcoming this type of constipation, as the intestinal tract is normal. Only the rectum is at fault. The treatment should be by enemas rather than cathartics. The rectum is normally empty, and distention by fecal material gives the stimulus. Responding to the slightest stimulus will do a great deal to overcome the condition.

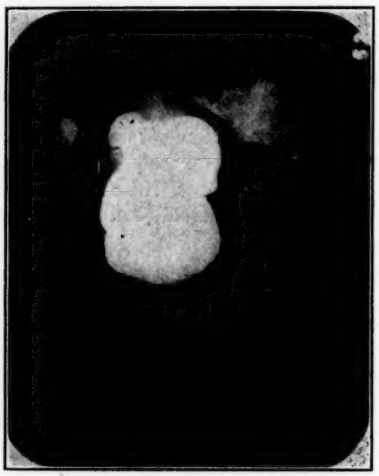

Fig. 2.—Dyschesia. Showing Rectum atonic and distended with impacted material.

In summary, then, five different types of constipation have been enumerated:

First, ileal stasis, where the patient complains of frequent nausea and occasional vomiting but no pain. The condition is associated with visceroptosis, and can be permanently relieved only by correcting the underlying condition.

Second, cecal stasis, which results in distention and atony of the cecum, with symptoms resembling mild chronic appendicitis. The patient may not be aware of the constipation. Stimulatory cathartics and dietetic treatment are indicated.

Third, spastic constipation, occurring mainly in well-nourished individuals. The patient complains of "gas" and the condition is characterized by attacks of severe intestinal pain and tenderness on pressure over the colon. Soothing the bowel, not with barium, but with concentrated food and an antispasmodic is necessary.

Fourth, atonic constipation, which occurs most frequently in the asthenic type. It is characterized by vague, indefinite complaints on the part of the patient and inactivity of the bowels. Medicinal stimulation of the colon is indicated.

Fifth, dyschesia, in which the entire intestinal tract is normal with the exception of the rectum. The distention and atony of the rectum must be overcome by enemas and re-education rather than diet and purgatives.

1801 *Eye Street, N. W.*

PHYSICAL EXAMINATIONS NECESSARY IN DIAGNOSIS.*

By C. R. ANDERSON, M. D., Winchester, Va.

Diagnosis is the bestowing of a name upon a certain assemblage of pathological phenomena. Its final object is to be able to treat a disease intelligently.

The object of this paper is to impress upon the profession the very great importance of making a careful and thorough examination of those who seek the physician for relief of their ailments.

We all admit that the scientific way is the right way, but, due to the rush and bustle of business, how prone we are to become negligent, careless, and jump at conclusions, taking too much for granted, thereby making serious mistakes, damaging to the patient and often to the doctor. For these reasons I desire to lay stress on physical examinations, which include the various laboratory methods. The term physical signs is by common consent applied to objective symptoms, which latter are usually much more important in arriving at a diagnosis than the subjective symptoms, of

*Read at the meeting of the Warren, Rappahannock and Page Medical Society in Front Royal, Va., November 9, 1927.

which we hear so much in office and home, which are often puzzling, misleading or incongruous.

A diagnostician must be a good observer and at the same time be able to reason correctly. Approach all cases with a mind open to impression and without preconceived and fixed ideas. It is not my object to underrate the importance of subjective symptoms, but fear we may be misled thereby and become content to draw conclusions, make a diagnosis and institute treatment which later we may regret. We admit physical examination consumes time and labor but the reward of finding the trouble outweighs the labor and time spent. Even if we are unable to produce a cure, the patient is satisfied and often makes use of the expression, "I am glad to know my trouble; I have had a thorough examination and I accept the consequences".

How many repeated visits have we made to homes and at each trip the diagnosis is still in doubt. This, perhaps, could have been established at the first visit if we had been more thorough in our first examination,—made examination of urine, stethoscopic examination of back, taken time to turn the patient on his side, examined the middle ear, looked in the throat, looked around and exercised scientific reasoning as well as scientific observation. Had such examinations been made, established conclusions could have been deduced from them —not as accurately, I admit, as in mathematics, —as 3 and 3 does not always make six in the reaction of the human body;—if so, we would not encounter serious symptoms in some patients from a medicinal dose of quinine, or urticaria after eating strawberries or shell fish.

The very reason that patients often seek consultation of so-called specialists in the larger cities, is due to the fact that the family doctor has failed to exercise the agencies at his command in making a careful examination, overlooking the little things, not making use of the X-ray or laboratory and other appliances of diagnosis. Often these patients have a perfect right to go without being referred, to seek the services of one who will stand on his feet and put forth efforts to find the cause and often to give relief.

Thoroughness, equipment and industry are and should be demanded by the laity of the medical profession and there is a general trend that they are willing to pay for the right kind of services.

The vest pocket C-C and favorite prescription may satisfy some, a few, but not the masses. The masses are looking for attention; they want to observe and be observed.

Under objective symptoms, observe general appearance of dress, general behavior, clothing buttoned with wrong button, vest soiled with dropping of food, ammonical odor, shoes unfastened—all indicate forms of pathologic condition. Be sure to take in consideration height, weight, conformation of body, diathesis, cachexias, posture in bed, the dorsal inert or passive posture when the patient lies on back but is slipping towards foot of bed. This uncomfortable position, which interferes with the respiratory movement, is observed in conditions of great weakness, acute infectious diseases, and is especially characteristic of typhoid fever, even at an early period, because of the muscular weakness and mental apathy. The rigid dorsal posture with both legs drawn up may be indicative of general or pelvic peritonitis; one leg flexed, appendicitis or hip disease; lying on one side, usually some acute infection of chest, lying usually on affected side to limit motion, thereby lessening pain.

Observe station, the way the patient stands. See if there is deviation or swaying from the normal with eyes open or closed.

Gait should be attentively observed, with the legs stripped and in his bare feet.

How often in meeting people unprofessionally does one form an unconscious judgment of character and peculiarities based upon observation. The furtive look and the inability to meet squarely the eyes of the physician may indicate mental weakness, not always to be interpreted as such, as ingrained timidity or bashfulness may likewise produce a baseless hang-dog manner and expression.

The loose careless way of examining soldiers in army camps I mention only to condemn. It was my misfortune to observe the habitual custom of taking temperature of all soldiers applying at the infirmary for treatment and, if found normal, they were marked for duty regardless of all subjective symptoms. This frequently later necessitated visits to tents of the unfortunates, where, upon careful examination, they were often found to be suffering from advanced pathological conditions. The

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blame for such lax methods rested solely upon the officer in charge.

One of the common symptoms that confronts us today, for example, is vertigo. How can we treat this condition without making a thorough physical examination? Vertigo is the cause of much alarm to the patient and the detection of its origin in many cases is of great importance. Allow me to enumerate the numerous causes of this disagreeable condition: neurasthenia, lithemia, gastric disorders, arteriosclerosis, valvular diseases of the heart, aneurism, Meniere's disease, eye strain, epilepsy, brain tumors, abuse of tea, coffee, alcohol, and auto-intoxication. This common symptom often requires, therefore, long tedious examinations to find the cause before rational treatment can be instituted.

How many ectopic conditions could have been referred to the surgeon before a fatal rupture had occurred had the physician taken time to have made a digital examination and obtained a careful history of the individual? How many pus appendices have ruptured, requiring long tedious drainage and convalescence, when, had a thorough examination been made and diagnosis established, the surgeon might otherwise have been enabled to perform a clean operation? In other words, the failure of an early diagnosis is often due to the carelessness of the examiner or to gross ignorance.

How often do we prescribe over the telephone for a pain in the belly that often turns out to be appendicitis or serious lesions? How often do we immediatly give some hot anodyne for a terrific pain in the abdomen when palpation alone would tell us that the individual was suffering from perforated gastric or duodenal ulcer?

I desire to recite two cases in closing, demanding the importance of making a painstaking and methodical examination.

1. The first patient was a man who complained of great pain in the sacral region, this having been present for two weeks. Patient instituted self-treatment in the way of plasters and purgatives, I was called suddenly to see him in a condition of collapse in an orchard. Temperature was normal, and there was practically no other indication of his trouble. Examination of heart failed to reveal any lesions. He was advised to go home and to bed. I was called next day for same symptoms. A high digital examination of rectum encountered a hard spicule of bone which was removed with much difficulty. The spicule was barbed at one end, and its irritating position produced the reflex symptoms mentioned. The patient made a quick recovery after its removal.

2. Several years ago I was called to see a child that was crying constantly. On examination, no subjective symptoms were noted other than the crying to enable me to make a diagnosis. After looking carefully in the throat, nose and ears, palpating the abdomen, etc., I returned home, content to leave an anodyne. Being called back the next day for same symptoms, I had all the clothing removed with the intention of beginning at the top of its head and going to the bottom of its feet. A sensitive area was found over the ninth rib in mid-axillary line which the sense of touch revealed as a hard body 2½ inches long. By pressing on one end of this hard body, the skin protruded from the other end, and by pushing it through the skin surface a large darning needle was removed with the aid of a hemostat. How it got there I cannot say. There were no signs of a puncture externally. The baby ceased crying after its removal.

I mention these only to impress that a careful physical examination is due each and every individual. I believe that the human race does not complain unless there is some pathological condition existing. When your patient shows signs of multiple arthritis or multiple neuritis, do not place yourself in the embarrassing position of making a blunt diagnosis of teeth or tonsil infection; do not blurt out expression, to have your teeth pulled or your tonsils removed, for, in many instances, they may remove both sets for your inspection or inform you that they had their tonsils removed two years ago. When the poor soul comes to your office with a pain in his right side, do not immediately say, go to the hospital and have your appendix removed, for, if you take the trouble, you may find a beautiful scar that some surgeon had made in its removal years ago. When the patient is limping and his face is awry, do not send him to the shoe store for arch supports. Perhaps he has infected tonsils or his teeth are bad.

All of this is to impress upon you the importance of keeping your mouth closed unless you have had time to look the patient over before venturing a snapshot diagnosis. A careless diagnosis is much worse than a gunshot prescription. A gunshot prescription is indicative of a snapshot diagnosis.

President's Page

A Further Consideration of the Advisability of the State Society Sponsoring Some Plan of Post-Graduate or College Extension Work.

It will be recalled as announced in a previous issue of the *Medical Monthly*, that the Dean of the University, the President of the Medical College of Virginia, the Commissioner of Public Health, and the President of the Society, were appointed a committee by the Council, at its January meeting, to make further study relative to didactic lectures, demonstrations, or other means of postgraduate work, and to make recommendations.

By way of ascertaining as directly as possible the wishes of those interested, a questionnaire in the way of a referendum was sent out on May 10, to the 1,840 members of the Society, and on the evening of June 21, the committee met in Richmond to study the matter further.

A tabulation of the 393 replies received may be of interest:

To QUESTION 1: "Do you believe that some such plan as suggested if put into execution would be of service to you?" 330 replied in the affirmative, and 63 in the negative.

To QUESTION 2: "As a beginning would you prefer: (a) that a trial be made of arranging a *College Extension Course* after the usual plan of one or more lectures or demonstrations weekly, extending over a given period, of ten or twelve weeks; or, (b) that a trial be made of clinical demonstrations, etc., by a teacher or teachers of recognized ability, given through half day or day periods in conjunction with the meetings of your local organization?" 118 replies favored college extension courses and 253 favored instruction given as clinics, etc., in connection with the work of local organizations.

To QUESTION 3: "Would you be willing to make an especial effort to attend clinics given within reach of you, and would you be willing to cooperate in securing cases and material for demonstrations?" 352 replied in the affirmative and 41 in the negative.

To QUESTION 4: "Do you favor the undertaking?" 353 replied in the affirmative and 40 in the negative.

It is particularly interesting to note that of the total number, 249 of the 353 who expressed themselves as favorable to undertaking postgraduate work were from sections of the State outside the four larger cities, this due possibly to the fact that those resident in the centers have free access to staff meetings of the hospitals, etc.

After a careful consideration of the replies to the questionnaires and the numerous comments made by those replying, the feeling of the committee was that while there is an evident desire upon the part of a considerable proportion of the profession of the State for some systematic means of review and of keeping informed in current advances, the means to this end could better be accomplished by beginning with the encouragement of a preclinic day at the meetings of such local organizations as were favorable to the undertaking, particularly by arranging for a preclinic day at the coming meeting of the State Society, should the local committee feel that sufficient material could be obtained for demonstrations. It was also suggested that in the event it were found through expirement that the local organizations throughout the State, or any considerable number might so desire, that the State Society, through a committee, might to advantage act as a sort of bureau in arranging for supplying suitable clinicians for the demonstrations, etc., and in adding to arrange programs, and in correlating such programs with those of the medical institutions. In conformity with the above, the following resolutions were adopted:

1. That the University of Virginia, through its Extension Department, be requested to make a further study as to the needs and desires of the profession of the State from the standpoint of post-graduate or extension work among them, and to aid in formulating plans for meeting the needs.

2. That the Committee endorses the postgraduate clinics and demonstrations now conducted by the medical schools of the State and urges the members of the Medical Society of Virginia to patronize them.

3. The Committee recommends that the Pro-

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gram Committee of the Society put on post-graduate clinics and demonstrations at its next annual meeting in Danville.

J. W. PRESTON, M. D.,
President, Medical Society of Va.

Roentgenology

Roentgen-Ray Diagnosis.

LEOPOLD JACHES, M. D., Radiologist, Mt. Sinai Hospital, New York City.

(*Continued from page* 208)

DISEASES OF THE BONES.

Bone diseases can roughly be divided into three large groups: (*a*) inflammatory; (*b*) neoplastic, and (*c*) constitutional.

(*a*) The most frequent of the inflammatory diseases is osteomyelitis; next in frequency are syphilis, bone abscess and typhoid; least frequent is tuberculosis of the shaft.

Osteomyelitis is hardly ever recognized in its early stages. A septic infarct may lodge in the bone marrow and give rise to clinical symptoms, but before it has caused a perceptible macroscopic change in the bone itself the roentgenogram will not show anything at variance from the normal. Consequently, it is very important to remember that early osteomyelitis cannot be ruled out on the strength of the negative roentgenogram. As the disease progresses, its various stages are brilliantly revealed. At first there is localized widening of the transparent central area due to erosion of the corticalis. Soon the inflammatory process extends through the corticalis and causes a reaction in the periosteum, which begins to form new bone. If the process is quickly arrested, there results a thickening or sclerosis of the corticalis, possibly with a cavity in the medullary canal, which sometimes contains one or more sequestra. If the process extends, especially if it is a rapid one, the greater part or the whole of the shaft may become a sequestrum which is enveloped by the bone newly formed from the periosteum—the involucrum. The roentgen ray, better than any other means, allows the surgeon to follow this process and gives him the indications for his procedure. He can carefully watch developments and step in at the proper moment.

Syphilis generally manifests itself in the form of localized, occasionally generalized, periostitis of the shaft of the bone. When localized, it may present a uniform thickening of the corticalis and periosteum or a broken-up bony deposit, the so-called lacework periostitis. It may occur in all the long bones but is most frequent on the anterior ridge of the tibia or on the lateral surface of the distal half of the ulna. Other forms are irregular thickening with small areas of rarefaction resembling abscesses, except that the periostitis is more extensive and the rarefactions are multiple.

Another form of syphilis of the bone is gumma, which causes localized rarefaction of the bone. Its most frequent location is the humerus, where it is often discovered only after a fracture has occurred; but it may also occur in other bones. In such cases osteogenic sarcoma is generally thought of first, but a history of the previous infection, aided sometimes by a positive Wassermann reaction (the absence of which does not rule out the presence of bone syphilis), may help to make the diagnosis and prevent amputation.

Congenital syphilitic dactylitis is recognized by the cylindric mantle of periostitis that envelops the apparently normal shaft.

Syphilitic osteomyelitis is fairly common and cannot be distinguished from the pyogenic type, except that clinical symptoms are less manifest.

Bone abscess is seen as a small area of rarefaction in the corticalis of a long bone amid localized periostitis. Typhoid bone infection may involve the spine for the long bones. It is destructive at first but later causes periosteal involvement and in the long bones may resemble abscess. The history generally makes the diagnosis.

Tuberculous osteomyelitis in adults is very rare. There are few authentic cases on record in which tuberculosis was established beyond all doubt by the demonstration of the tubercle bacillus in the bone or marrow. The few reliable cases reported show a thinning of the corticalis, general haziness of bone and medullary cavity, and no periostitis. Most other cases reported as tuberculosis are, to say the least, doubtful and generally show a mixed infection.

Congenital tuberculous dactylitis causes a widening of the entire phalanx with moderate irregular bone absorption and very well defined bone structures. It has no periosteal thickening.

(*b*) Neoplasms are either benign or malignant, primary or metastatic.

Benign neoplasms are generally osteomas, exostoses, osteochondromas, enchrondromas, cysts and the giant cell tumors. Osteomas and exostoses can generally be recognized because their structure is that of the normal bone, from which they arise. They are slow growing and are mainly found on the shafts of the long bones, but near their epiphyses. Osteochondromas also generally arise from the long bones and present normal bone structure interspersed with areas of transparency—cartilage.

Enchondromas, which most frequently affect the bones of the hands and feet, are situated within the bone, causing thinning and expansion of the corticalis and disappearance of most of the normal bone, which is replaced by the radiotransparent cartilage.

Cysts expand the bone but slightly and cause thinning of the corticalis. They are homogeneously transparent and have very few, and more often no, trabeculae. They do not cause pain or enlargement of the limb and are as a rule discovered only after trauma which results in fracture.

Giant cell tumors are mentioned here because they are clinically nonmalignant and to some extent resemble bone cysts except that they are multilocular and cause greater expansion of the bone and are situated at the ends of the long bones. They rarely metastasize or recur.

Primary malignant bone neoplasms are, to the best of our present-day knowledge, the sarcomas. Carcinoma is always metastatic. Sarcoma may also be metastatic.

Sarcoma is generally a destructive lesion. No bone is safe from its attack. When periosteum is involved there will often be new but irregular bone formation along its surface. Soon the soft tissues are invaded. The periosteal thickening may be more or less uniform at first; eventually it becomes broken up and often presents characteristic lines radiating into the soft tissues and at right angles to the shaft. The bone often expands and the corticalis is destroyed. They metastasize very readily, especially into the lungs. It is imperative, therefore, to make a roentgen ray examination of the chest before any surgical procedure is undertaken.

The classification of this bone neoplasm has encountered great difficulty. During the last ten years, however, the work of the Sarcoma Registry has begun to bring order out of chaos. It would lead too far here to review its work to date. The reader is referred to two excellent monographs, one by Codman on Bone Sarcoma, published by Paul B. Hoeber, New York, and the other by Anatole Kolodny in supplement 1, *Surgery, Gynecology and Obstetrics*, 1927.

There are two main types of metastatic carcinoma, the bone productive and the bone destructive. The former may involve the entire spine, the pelvis, the humeri and femurs; it occurs most frequently secondary to carcinoma of the prostate, but has been observed also secondary to carcinoma of the breast, thyroid, lung, pharynx, skin and other organs.

The bone destructive type may involve all bones, including the skull. It is most frequent in carcinoma of the breast, thyroid, uterus and hypernephroma, but occurs also after other primary lesions. The involvement may be single or multiple; the former most frequently affects the trochanteric region of the femur, the latter may affect every bone in the body. It is a peculiar phenomenon that the greater the involvement the less malignant the course, except in hypernephroma and myeloma. There is even at least one case on record in which after all the bones of the body were riddled by the process, radiotherapy caused a recalcification of all the lesions.

One characteristic of all bone tumors is well worth remembering: they do not cross a joint.

(*c*) Constitutional or nutritional bone diseases are scurvy, rickets, osteitis deformans (Paget's disease) and osteitis fibrosa (Recklinghausen), which are fairly frequent. The rarer lesions are achondroplasia, osteogenesis imperfecta and osteomalacia. In scurvy the long bones, especially the femur and the tibia, are involved. Periostitis occurs and the epiphysial ends of the shafts are broadened out and irregular (fringy). As the disease progresses the subperiosteal hemorrhages organize, are even calcified, and cast dense shadows which are the most diagnostic marks of the disease.

Rickets presents a similar appearance, except for the absence of the periosteal lesion. In the more advanced or healed stages, the bones show marked bowing. The rickety rosary is often easily recognized by a spade-like expansion of the sternal ends of the ribs.

Paget's disease occurs most frequently in

middle or advanced age. It may involve only one bone, generally the tibia, but most often it affects the skull at a very early stage and then invades the lower spine, the pelvis, the femurs and other bones. In all the bones except the skull it is characterized by a mixture of rarefaction and sclerosis, which resembles normal bone seen through a magnifying glass slightly out of focus. In the skull there is thickening of the vertex, with numerous larger and smaller circular patches of undifferentiated calcium deposits. The base of the skull is never involved.

Osteitis fibrosa attacks the young as well as the old and is similar in appearance to Paget's disease, but affects only the long bones. There is more rarefaction, which results in a bending of the bones. It rarely invades the skull.

Achondroplasia shows shortening and broadening of the long bones.

Osteogenesis imperfecta, which occurs in young children, is characterized by atrophy and thinning of the shafts without shortening, frequently accompanied by fractures. The vertebrae flatten and height is reduced.

In osteomalacia, which is most frequent in women, there is irregular rarefaction and, because of the softening, extreme deformity.

A lesion of unknown origin which generally affects the young is a marked absorption of the patella or of the tarsal scaphoid, which heals spontaneously. It was first described by Köhler. Another lesion, also bearing his name, is partial destruction of the head of the second metatarsal bone and, to a lesser extent, of the base of the contiguous phalanx.

(To be continued.)

Miscellaneous

Contract Practice.

The following proposed draft on "Contract Practice" has been prepared by the Board of Trustees of the Richmond Acadamy of Medicine and will be presented to the general membership at its next meeting on the second Tuesday in September. We take the liberty of publishing it as it may prove of interest to other societies.

The traditional attitude of the medical profession is opposed to contract practice except when some substantial advantage to the people served by the contract arises out of it, and when this advantage is not one of reduced fees for people able to pay standard fees.

The advantages usually to be recognized as legitimate are:

(a) Prevention of disease or accident.

(b) Increased efficiency in treatment through the more ready availability of the practitioner, or his special knowledge of disease or accident likely to arise, or his familiarity with facilities provided for treatment.

(c) Protection of a party or corporation from liability to unjust claims or suits.

A practitioner who accepts a contract should be prepared to show that it accords with accepted standards of ethics, and further that legitimate advantages of the contract are not used to cloak unethical extentions of its provisions.

Except in isolated communities where it is necessary to make unusual arrangements, the family unit is not a proper object of contract.

A contract should not provide compensation below the prevailing standard of fees.

The group or party with which a practitioner enters into a contract should have some social or economic purpose resulting in a unity of living or working condition and the object of the organization should be obviously above a suspicion that medical services at reduced rates is any part of that object or purpose.

A contract tends to be relieved of suspicion of unworthy purposes in proportion as the services rendered are limited to promises where employees work, and the hospital or infirmary quarters routinely maintained to meet the needs covered by the contract.

While the principles outlined have neither the sharply defined character nor the force of a by-law, this lack is not considered material in maintaining the highest standard of ethical practice. Whatever wording is adopted in the matter of contract practice, no disciplinary action may be had against a fellow practitioner without a hearing of the evidence. The by-laws of the Academy clearly provide for procedure against a fellow deemed guilty of unethical conduct, of which an unethical contract or unethical conduct under guise of a reasonable contract, may be an instance. The responsibility rests equally upon every fellow of the Academy to bring charges of unethical conduct when it is believed that the traditional and accepted standards of the profession are being violated.

Woman's Auxiliary, Medical Society of Virginia

DOCTOR: PLEASE CALL ATTENTION OF YOUR WIFE TO THIS DEPARTMENT.

At the request of the officers of the Auxiliary, this space has been set aside for communications from them regarding matters of interest, both to the profession and to the women members of their families.

All communications should be addressed to Mrs. E. F. Truitt, Secretary and Treasurer, Cottage Toll Road, R. F. D., Norfolk, Va.

Mrs. Allen H. Bunce Installed as National A. M. A. Auxiliary Head.

More than 600 women members, from all parts of the United States registered attendance upon the convention of the Woman's Auxiliary to the American Medical Association, which has units in 30 states, including a membership of 10,000 women.

Mrs. John O. McReynolds, Dallas, Texas, national president of the auxiliary, on June 12, spoke before the house of delegates of the American Medical Association. Auxiliary members felt this address to be a signal honor, since generally no outsiders are permitted at a house of delegates meeting.

The executive board of the Woman's Auxiliary, American Medical Association, met the same day at 9 A. M. at the Woman's club with Mrs. John O. McReynolds, national president, presiding. The presidents' breakfast was given in honor of the president-elect, Mrs. Alllen H. Bunce, of Atlanta, Ga., and the past presidents, Mrs. S. V. Red, of Houston, Texas; Mrs. F. P. Gengenbach and Mrs. Seale Harris.

For the Wednesday morning session at the Automobile club, termed "National Day," Mrs. McReynolds presided. Mrs. Ben Davis, president of the Minnesota State Auxiliary, gave the welcome for Minnesota, and welcomes to the Twin Cities were voiced by Mrs. H. B. Sweetser, president of the Hennepin County Auxiliary, and Mrs. A. G. Schultz, of St. Paul, president of the Ramsey County Auxiliary.

Auxiliary Work Lauded

That women have a definite effect on the administration of their community and state was pointed out by Dr. A. T. McCormack, of Louisville, Ky. "In Kentucky, counties where units of the auxiliary are organized were indispensable in a recent campaign against political exploitation of the state board of health," he said. Mrs. McCormack, wife of Dr. McCormack, is president of the Woman's Auxiliary of the Southern Medical Association.

Dr. J. O. McReynolds, of Dallas, Texas, spoke on "Friendship."

Dr. Thayer, new president of the A. M. A., told the women their first consideration should be the promotion of public health. He said the A. M. A. has done more good in bringing men together than in any other way, citing the overcoming of petty jealousies as the outstanding result of the companionship brought about through the A. M. A.

"After we become acquainted we learn that the majority of men are rather decent fellows," he said, "and we are more ready to co-operate with them." He said the auxiliary doubtless would find the same experience.

Dr. Jabez Jackson, outgoing president of the A. M. A., said one of the most essential things in the auxiliary is the quality of its leadership.

"I have absolute faith in the future of the Woman's Auxiliary," he said.

"The auxiliary is an organization centered about only one profession, and should devote its powers to projects vital to the profession and the public it serves," he declared. "Professional jealousy and mutual distrust will disappear with closer organization of members of the profession and their wives."

"Preserve the quality of your leadership and avoid entangling alliances and her future is secured," he said.

Dr. J. H. J. Upham (chairman Advisory Council), said, "the women could help by urging husbands to attend medical meetings. The effort of writing a paper does a doctor more good than hearing one read." He said, "get your husbands out of that rut."

Warned Against Propaganda

Dr. Martha Welpton, of San Diego, only woman delegate from California to the A. M. A., voiced strong opposition to the new Newton Bill providing for an appropriation of $1,000,000, about $21,000 from each state annually to be used in child welfare work "and other services."

Dr. Welpton said the new bill might be no more efficient than was the Sheppard-Towner

bill which was opposed by the Medical society on the ground that it was put out under the Department of Labor rather than under the Public Health department, and has been administered by a lay person at Washington.

Dr. Welpton made a plea for state administration of the child welfare problem, declaring that the situation is different in each state and may be better handled in that way than nationally.

In warning the women not to work for the Newton bill when it comes up in the next congress, Dr. Welpton said, "The ideas back of it are good but the whole thing is illogical."

Dr. Welpton asked the auxiliary members not to allow their organization to become the agency for a spread of propaganda, and urged that they study the legislative enactments having to do with health training and service with impartial and unsentimental minds.

"A woman cannot eat her cake and have it too," said Dr. Lulu Hunt Peters, of Los Angeles, Calif., author of the reducers' guide, "Diet and Health, a Key to the Calories," in pointing out to the members of the auxiliary Wednesday the charms of the stringent reducing regime.

Mrs. Williard Bartlett, president of the Missouri State Auxiliary, spoke on "Our Official Duties;" and Mrs. F. W. Gregor, president of the Indiana State Auxiliary on "Medical Legislation." "Fact Finding in State Medical History" was the subject of a talk by Mrs. A. R. McCormick, of Louisville, Ky.

The Woman's Auxiliary of Pittsylvania County and Danville Medical Society

Had an informal meeting at the Y. W. C. A. in Danville, on June the 13th. At this meeting, the Auxiliary had the pleasure of having with them Miss Agnes V. Edwards, secretary of the Medical Society of Virginia. Work in the local Auxiliary was discussed and also plans for the State medical convention to be held in Danville, October 16-18. Mrs. T. W. Edmunds, Danville, is president; Mrs. W. O. Emerson, Wenonda, vice-president; Mrs. Samuel Newman, Danville, secretary; and Mrs. J. J. Neal, Danville, chairman of publicity.

MORE THAN SMILED.

Mr. Jones had recently become the father of triplets. The minister stopped him on the street to congratulate him.

"Well, Jones," he said, "I hear the Lord has smiled on you."

"Smiled at me?" replied Jones. "He laughed out loud."—(*Selected*).

The Truth About Medicine

In addition to the articles enumerated in our letter of April 28th, the following have been accepted:

H. K. Mulford Co.
- Diphtheria Toxoid—Mulford.

Parke, Davis & Co.
- Glaseptic Ampoules Solution Glucose, 50 per cent, 20 c.c.
- Glaseptic Ampoules Solution Glucose, 50 per cent, 50 c.c.
- Stearodine.
- Stearodine Tablets.

Pasteur Institute of St. Louis.
- Antirabic Virus (Semple).

G. D. Searle & Co.
- Bismuth Sodium Tartrate—Searle.
- Ampoules Bismuth Sodium Tartrate—Searle, 2 c.c.

Swan-Myers Co.
- Biennial Sage Concentrated Pollen Extract—Swan-Myers.
- Pollen Extracts—Swan-Myers 2000 unit packages.

CHANGE OF AGENCY.

Viking Palatable Cod Liver Oil, formerly distributed by Sigurd E. Roll, Chicago, is now distributed by Viking Health Products Co., Chicago. The Council has continued the acceptance of Viking Palatable Cod Liver Oil under the new distributor.

NEW AND NON-OFFICIAL REMEDIES

Ethylene—Cheney.—A brand of ethylene for anesthesia—N. N. R. (New and Non-official Remedies, 1928, p. 51). The Cheney Chemical Co. (Jour. A. M. A., May 5, 1928, p. 1444).

Lipiodol-Lafay.—Iodized Poppy-seed Oil, 40 per cent.—An iodine addition product of poppy-seed oil containing 39 to 41 per cent of iodine in organic combination. Lipiodol-Lafay is used as a contrast medium in myelography and pyelography, for detecting urethral strictures, in the spinal column for detecting tumors, and in other conditions for which roentgenologic exploration is desired. It is supplied in ampoules containing 1, 2, 3 and 5 c.c. respectively. E. Fougera & Co., New York.

Lipiodol Radiologique Descendant.—Iodized Poppy-seed Oil 35 per cent.—An iodine addition product of poppy-seed oil containing 34 to 36 per cent of iodine in organic combination. In subarachnoid injection for roentgenray examination, lipiodol radiologique descendant is used for the recognition of intradural tumors. E. Fougera & Co., New York.

Lipiodol Radiologique Ascendant.—Iodized Poppy-seed Oil 10 per cent.—An iodine addition product of poppy-seed oil containing 9.8 to 11.2 per cent of iodine in organic combination. In subarachnoid injection for roentgenray examination, lipiodol radiologique ascendant is used for recognition of intradural tumors when it is desired to employ a contrast medium of lesser density than that of the spinal fluid. E. Fougera & Co., New York.

Mead's Powdered Boilable Protein Milk.—A modified milk preparation having a relatively high protein content and a relatively low carbohydrate content. Each 100 Gm. contains approximately protein, 39 Gm.; butter fat, 27 Gm.; lactose, 24 Gm.; free lactic acid, 2 Gm.; ash, 6 Gm., and moisture, 2 Gm. When suitably mixed with water, powdered boilable protein milk is useful for correcting intestinal disorders of infants and children. Mead Johnson and Company, Evansville, Ind.

Antirabic Virus (Semple).—A phenol killed antirabic vaccine prepared according to the general method of David Semple (New and Non-official Remedies, 1928, p. 363). It is marketed in packages of fourteen doses, each dose consisting of 2 c.c.; all the doses are of the same potency. Pasteur Institute of St. Louis, St. Louis. (Jour. A. M. A., May 19, 1928, p. 1627).

Stearodine.—Calcium Iodostearate.—It contains from 26 to 28 per cent of iodine in organic combination. Stearodine is used as a substitute for the inorganic iodides, over which it is claimed to have an advantage in that it is longer retained and therefore better utilized. See Iodized Fats and Fatty Acids, New and Non-official Remedies, 1928, p. 212. Stearodine is also supplied in the form of tablets, each containing stearodine, equivalent to 0.01 Gm. of iodine. Parke, Davis & Co., Detroit. (Jour. A. M. A., May 26, 1928, p. 1711).

Book Announcements

Operative Surgery. By J. SHELTON HORSLEY, M. D., F. A. C. S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. Third Edition. St. Louis. The C. V. Mosby Company. 1928. Octavo of 893 pages, with 756 Original Illustrations by MISS HELEN LORRAINE. Cloth. Price, $15.00.

Modern Methods of Treatment. By LOGAN CLENDENING, M. D., Associate Professor of Medicine, Lecturer on Therapeutics, Medical Department of the University of Kansas. With Chapters on Special Subjects by H. C. Anderson, M. D.; J. B. Cowherd, M. D.; H. P. Kuhn, M. D.; Carl O. Rickter, M. G.; F. C. Neff, M. D.; E. H. Skinner, M. D.; and E. R. DeWeese, M. D. Second Edition. St. Louis. The C. V. Mosby Company. 1928. Octavo of 815 pages with a number of illustrations. Cloth. Price, $10.00.

Syphilis. A Treatise on Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Prophylaxis, and Treatment. By HENRY H. HAZEN, A. M., M. D., Professor of Dermatology and Syphilology, Medical Department of Georgetown University, and in the Medical Department of Howard University; Author of "Diseases of the Skin"; "Cancer of the Skin", etc. Second Edition. St. Louis. The C. V. Mosby Company. 1928. Octavo of 643 pages with 165 illustrations including 16 Figures in Colors. Cloth. Price, $10.00.

A Handbook of Clinical Gynecology and Obstetrics. By RAE THORNTON LA VAKE, M. D., F. A. C. S., Assistant Professor of Obstetrics and Gynecology, University of Minnesota; Clinician in Charge of the Obstetric and Gynecologic Department of the University of Minnesota Dispensary. St. Louis. The C. V. Mosby Company. 1928. Octavo of 281 pages. Illustrated. Cloth. Price, $4.00.

The Duodenum. Medical, Radiologic and Surgical Studies. By PIERRE DUVAL, JEAN CHARLES ROUX, and HENRI BECLERE, of the Surgical Clinic, Faculty of Medicine, Paris. Translated by E. P. QUAIN, M. D. St. Louis. The C. V. Mosby Company. 1928. Octavo of 212 pages, with a number of illustrations. Cloth. Price, $5.00.

New and Nonofficial Remedies, 1928, containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1, 1928. Cloth. Price, postpaid, $1.50. Pp. 489 XLIX. Chicago. American Medical Association.

This book is the work of the Council on Pharmacy and Chemistry of the American Medical Association. For some twenty years the Council's plan has been the publication annually of a book containing descriptions of those unofficial preparations which, after careful investigation, have been found worthy of recognition and consideration by the medical profession.

The book is conveniently arranged for reference: each preparation is classified, and each classification is preceded by an authoritative and up to date discussion of the composition, actions, uses, and dosage of the medicament involved. Products that have been admitted are re-examined at stated intervals to determine if they are keeping their promise of therapeutic usefulness; and new products are admitted as they are found acceptable.

On account of the careful revision and the current additions, New and Non-official Remedies is essentially a new book each year, indispensable to the physician who would keep up with the march of therapeutic progress.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1927. Cloth. Price, postpaid, $1.00. Pp. 103. Chicago: American Medical Association, 1928.

The Council on Pharmacy and Chemistry of the American Medical Association annually publishes the reports which tell the reasons for non-acceptance of those products which during the year it has found unworthy of recognition. Some of these reports have been published in abstract in *The Journal;* all are contained in full in this volume.

A glance at the index shows, however, that these reports do not always deal with articles that have been actually rejected by the Council. Preliminary reports are frequently made on new products which appear promising but for which there is not yet sufficient evidence to warrant inclusion in New and Non-official Remedies.

The Health and Happiness Series. A Series of Health Education Books Designed for Use in the Elementary Schools. By S. WEIR NEWMAYER, A. M., M. D., Supervisor of Medical Inspection of Public Schools, Philadelphia, and EDWIN C. BROOME, Ph.D., LL.D., Superintendent of Schools, Philadelphia. American Book Company. New York, Cincinnati, Chicago, Boston, and Atlanta. 12mo. Cloth.

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Editorial

Post-Graduate Study.

The action of the Committee on Post-Graduate Study, as set forth by Dr. J. W. Preston, on the PRESIDENT'S PAGE, this issue, will be read with interest by members of the Medical Society of Virginia. Analysis of the questionnaire indicated the thought of members on this question. The busy practitioner is ever eager to review clinical material, to discuss diagnoses, to attend upon the considerations of treatment, and to renew acquaintance with current medical publications touching upon a survey of the diseases under consideration.

A clinic day before or during the sessions of assembled medical gatherings offers the most feasible plan for bringing about this desirable experience meeting and medical study of cases. And it argurs well that a start will be made in this direction at our Danville meeting in October, when an attempt will be made to bring together, in an orderly program, a group of patients with demonstrators or leaders. In this way a start may be made on the plan for post-graduate study in Virginia.

In the meantime, it is hoped a more extended and thorough inquiry will be instituted into the whole problem of post-graduate study in this State, under the auspices of the Extension Department of the University of Virginia. From this, it is believed a more accurate and complete plan may be devised for carrying forward any worth while plan.

Members of the Society are urged to arrange to attend the first day features of the Clinic Day, Tuesday, of the Danville meeting. Announcement of the order, place, and time of clinics will be made later.

The Harvey Tercentenary.

DISCOVERY OF THE CIRCULATION OF THE BLOOD.

Three hundred years ago William Harvey published his celebrated work, "Excitatio Anatomica de Motu Cordis et Sanguinis in Animalibus." After twelve years of investigation and the delivery of medical lectures describing his experiments and observations upon the subject of the circulation of the blood, this young English physician published this book, which revolutionized medicine of that day and formed the foundation of modern physiology.

This epochal event in medical history was fittingly celebrated recently in London.* under the auspices of the Royal College of Physicians.

In contemplating the work of William Harvey, it is interesting to note that, from the time of Galen, for a period of fourteen centuries, medicine was ignorant of the essential facts of heart action and blood circulation. The writings of Galen had formed the basis of medical knowledge during these dark centuries and it was with diffidence and trepidation that this investigator in anatomy in the seventeenth century turned from the old masters and wrote this new page in medical knowledge.

Vesalius, in 1542, had been bold enough to deny the existence of pores in the septum of the heart, and Realdo Columbus (1559), while denying the muscularity of the heart, had contended that the blood, and "spirits" passed from the right to the left ventricle, thus first describing what was afterward known to be the pulmonary circulation.

These predecessors of Harvey, at that ancient school of medicine, Padua, where Harvey, as a young man, studied anatomy, were themselves unaware of the reality of the circulation of blood. But Cannani had discovered the valves of the veins and Fabricus had published excellent drawings of this anatomical finding. The meaning, however, of the veins was not understood by these teachers of Harvey. The riddle of isolated anatomical findings in which William Harvey worked

*Described in detail in **The British Medical Journal**, May 19 and 26, 1928.

confused but stimulated his inquiring mind. Harvey pushed on in his experiments and dissections for years following his return to England, where he practiced for many years. Here Harvey finally completed his studies and published his contribution. But it should be remembered that even up to the time of his death, he did not know how the blood passes from arteries to veins, through capillaries. For it was four years after Harvey's death that Marcello Malpighi (1661) demonstrated, by means of an improved magnifying glass, the passage of blood through capillaries, from arteries to veins.

Harvey's monograph, describing his series of observations and experiments, as a literary and scientific work, is worthy of the international celebration that its three hundredth anniversary has occasioned. It may be read and reread, today, as a work of first moment, because of its literary excellence, its scientific method, and its famous discovery.

Copyrighted by British Medical Journal.

WILLIAM HARVEY, 1578-1657.

From the portrait by Cornelius Jansen belonging to the Royal College of Physicians of London.

Harvey's work among other things showed the following startling physiological and anatomical discoveries:

(1) That the heart contracts and that this coincides with the pulse.

(2) That the pulse is produced by the muscular contraction of the heart and the expulsion of blood into the arteries.

(3) That there are no "pores" in the septum, that the whole blood from the right ventricle is sent through the lungs to the left side of the heart, and that the whole blood in the left side is sent through the body.

(4) That the blood in the arteries and veins is the same blood.

William Harvey

William Harvey (1578-1657) was an English physician, and, as the discoverer of circulation of the blood, deserves highest of praise as the father of modern physiology and scientific medicine. He was born at Folkestone, England, April 1st, 1578. He studied in a grammar school at Canterbury and at sixteen went to Cambridge; at nineteen, taking his B. A. degree. Afterward he went to the University of Padua, Italy, studying at this celebrated school of medicine under Fabricus and Casserius, distinguished anatomists. At twenty-four, Harvey graduated in medicine here and returned to England, settling in London to practice. He married the daughter of Dr. Lancelot Browne, physician to Queen Elizabeth. In July, 1607, Harvey was admitted to the Royal College of Physicians, and in 1609 was made physician to St. Bartholomew's hospital. Harvey was censor of the college and in 1615 was appointed Lumleian lecturer. In his course of lectures, beginning in 1616, he first brought forward his observations upon the movements of the heart and blood.

In 1618 he was made physician extraordinary to King James I. In 1628, after twelve years of study and writing, his celebrated

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monograph on the movement of heart and blood was published. Following this Harvey traveled in Europe, with the royal family.

In 1636, after returning to London, he accompanied Charles I to Scotland. While in Edinburgh, when the king was occupied in discussing matters of state and church, Harvey made his observations at Bass Rock on generation and wrote his remarkable treatise, entitled "De Generatione."

Harvey was with the royal army under Charles I at Edgehill (October, 1642), where the issue was indecisive. After this Harvey went to Oxford and remained there for three years. While with Charles at Oxford, he was made Warden of Merton College. In 1646, when the city surrendered to Cromwellian forces, Harvey returned to London to find that his lodgings at Whitehall had been searched and valuable manuscripts and anatomical preparations had been seized. At sixty-eight years of age, he relinquished all professional duties, but he lived to be eighty years of age.

In person, William Harvey was not tall "but of the lowest stature, round faced, alabaster complexion, little eyes, round, very black, full of spirits, his hair black as a raven, but quite white twenty years before his death." A portrait of Harvey is now hanging in the library of the Royal College of Physicians, in London. It is by Cornelius Jansen. Harvey is represented as seated in large chair by a table, on which is observed a number of books.

The Recent Harvey Tercentenary Celebrations in London.

Delegates, representing universities and medical societies throughout the world, convened in London for the purpose of commemorating the three hundredth anniversary of the publication of the discovery of the circulation of the blood, as announced by William Harvey in his famous scientific classic. This great occasion was arranged by that ancient and distinguished body of scientists—the Royal College of Physicians of London.

The initial ceremony of the series of conventions of the Harvey Tercentenary was a reception of the delegates, numbering one hundred, by King George VI, at Buckingham Palace, on Monday, May 14th, last. The delegates were presented to His Majesty by Sir John Rose Bradford, K. C. M. G., F. R. S., President of the College.

The President made an address to the King, in which he called attention to the association of William Harvey with one of his predecessors on the throne of England, King Charles I, to whom Harvey's "De Motu Cordis" was dedicated. Mention was made of the attachment of King Charles I, as well as King James I, for Harvey, and of the material assistance given him by these sovereigns, while he was making investigations upon living animals in search of evidence with which to prove the circulation of the blood.

The King's reply was impressive, in that it expressed hearty sympathy with the importance and dignity of the celebrations about to be instituted in memory and honor of so distinguished a physician as Harvey, who had contributed so much to the store of human knowledge, and to the advancement of medical science. The King expressed pride in partaking in the exercises that would honor one who had been so intimately identified with England and with English science.

Following this came the reception of delegates and appropriate exercises in honor of Harvey by the Royal College of Physicians. Adorned in the habiliments of academic dress, distinguished scientists and delegates to the Tercentenary, foregathered in the library of the Royal College of Physicians, on the afternoon of May 14th, to witness the admission of the Honorary Fellows, Earl of Balfour, Sir Ernest Rutherford, Professor I. P. Pavlov, and Professor K. F. Wenckeback, and to hear the three eulogies upon Harvey's life and work by three distinguished visitors: first by Sir Charles Sherrington, second by a French physician, Professor A. Chaufford, and third, by a German anatomist, Professor Keibel.

On Wednesday evening, May 16th, the Harveian celebrations were brought to a close by a banquet and reception in London, at Guildhall. Nearly five hundred fellows and guests assembled in the art gallery and proceeded to seats at tables in the great hall. That was a distinguished gathering: the German, French, Italian, Belgian, Austrian, Greek, Finish ambassadors and ministers; Minister of Health of England, Secretary of Scotland, Archbishop of York, Archbishop of Wales; Dean of Westminster, Dean of St. Paul's; Cardinals and Rabbis; the Lord Chancellor; representatives from faculties of Universities of London and Edinburgh, Oxford and Cambridge; physicians and surgeons, including

Lord Dawson, of Peru, Sir Berkeley Moynihan, Sir James Perry and many others were present. After toasts were proposed and drank to the memory of William Harvey, three eulogies were pronounced upon the career of Harvey—an eminent scholar, physician, and research worker. The Minister of Health in England responded and drew attention to the greatness of the occasion which brought together so distinguished a body of men as were come to the British Isle for the purpose of honoring Harvey. Comment was made upon the remarkable fact that one of the delegates present was Professor Castiglioni, representing the University of Padua, where Harvey, over three hundred years ago, had studied anatomy and received his medical education.

Professor A. Castiglioni, of the University of Padua, in the Venetian domains, spoke of the freedom and encouragement which that institution had always enjoyed in the domain of anatomical research. Padua was the center of anatomical research in Europe for generations. Italy could point with pride to distinguished anatomists with whom Harvey worked and on whose work Harvey relied for data in making his epochal discovery in the movements of the heart and blood.

Finally, Professor W. H. Welch, of Johns Hopkins University, spoke and was stirred by thoughts of being present on an event of unexampled importance in the history of human thought. Dr. Welch was appreciative of the great occasion, of the striking and laudatory celebrations and receptions, and eulogies which he had witnessed in commemoration and in honor of one of the world's foremost men of science.

News Notes

University of Virginia, Department of Medicine has Finals.

Commencement exercises of the Medical Department of the University of Virginia were held June 10, 11 and 12, in conjunction with those of the other schools. Before the close of the exercises, President Alderman announced the creation of a trust fund totaling considerably in excess of $5,000,000 for the benefit of the University of Virginia. He stated that this gift was made by a loyal and devoted alumnus of the University, but the name of the donor and the plans and purposes of developments made possible by the gift are withheld for the present. The usual social features and class exercises were held and 304 graduates in the various schools were awarded diplomas; fifty-five of these were in the school of medicine. Graduates of this department represented eleven states and one foreign country.

Those receiving diplomas in medicine are listed below with their hospital appointments:

University of Virginia Hospital, University, Va.—Dr. Calvin Thomas Burton, Whitmell, Va.; Dr. Elizabeth Cocke Cole, Norfolk, Va.; Dr. Carson Lee Fifer, Wyoming, Del.; Dr. Edwin C. Hamblen, Greenville, Miss.; Dr. Hubert B. Holsinger, McGaheysville, Va.; Dr. Virgil L. Kelly, Jr., Oceana, W. Va.; Dr. Robert L. King, Pearisburg, Va.; Dr. Patrick Pih-Tsang Wu, Shanghai, China.

Barnes Hospial, St. Louis, Mo.—Dr. James Robert Adams, Charlottesville, Va.

Mason Clinic, Seattle, Wash.—Dr. Joel Wilson Baker, Roanoke, Va.; Dr. Louis Henry Edmunds, Halifax, Va.; Dr. John Norman Wilkinson, Gulfport, Miss.

Memorial Hospital, Richmond, Va.—Dr. Rufus Brittain, Tazewell, Va., and Dr. Douglas D. Vance, Bristol, Tenn.

Vanderbilt Hospital, Nashville, Tenn.—Dr. John Alfred Calhoun, Jr., Ensley, Ala.

Roosevelt Hospital, New York, N. Y.—Dr. Paul Douglas Camp, Jr., Franklin, Va.

T. C. and I. Hospital, Birmingham, Ala.—Dr. Willis Frank Cotton, McComb, Miss.

Germantown Hospital, Philadelphia, Pa.—Dr. John Henry Coulter, Jr., LaCrosse, Va.

Wyckoff Heights Hospital, Brooklyn, N. Y.—Dr. John E. Cox, Falkner, Miss.

Florence Infirmary, Florence, S. C.—Dr. Albert M. Eaddy, Johnsonville, S. C.

Lincoln Hospital, New York, N. Y.—Dr. Daniel Fallis, Brooklyn, N. Y.

Presbyterian Hospital, New York, N. Y.—Dr. Loren Pritchard Guy, Norfolk, Va.

Charleston General Hospital, Charleston, W. Va.—Dr. Edward Buchanan Holmes, North Holston, Va.

Massachusetts General Hospital, Boston, Mass.—Drs. William R. Jordan, Richmond, Va., and James Winston Watts, II, Lynchbur, Va.

Lenox Hill Hospital, New York.—Dr. Paul Kass, Houston, Texas.

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University Hospital, Ann Arbor, Mich.—Dr. William Louis Lacy, Culpeper, Va.

Coney Island Hospital, Brooklyn, N. Y.—Dr. Max Landman, New York, N. Y.

Vasser Brothers Hospital, Poughkeepsie, N. Y.—Dr. Ford K. Lucas, East Radford, Va.

Protestant Hospital, Norfolk, Va.—Dr. Paul McFarlane, Scottsville, Va.

New York Post-Graduate Hospital, New York, N. Y.—Dr. John Braxton McKee, Saltville, Va.

Bushwick Hospital, Brooklyn, N. Y.—Dr. Vincent G. Maggiore, Brooklyn, N. Y.

St. Vincent's Hospital, Norfolk, Va.—Dr. Vincent J. Meads, Portsmouth, Va., and Dr. David S. Phlegar, Jr., Christiansburg, Va.

Binghamton State Hospital, Binghamton, N. Y.—Dr. Oscar N. Morison, Christiansburg, Va.

Newell Sanitarium, Chattanooga, Tenn.—Dr. Cecil Edward Newell, Chattanooga, Tenn.

Cleveland City Hospital, Cleveland, Ohio.—Dr. Chester Reeves Nuckolls, Hillsville, Va.

Kings County Hospital, Brooklyn, N. Y.—Dr. Valentine Lawrence Puig, Jr., Laredo, Texas.

Sydenham Hospital, New York, N. Y.—Dr. Milton E. Robbins, Miami, Fla.

Lebanon Hospital, New York, N. Y.—Dr. Herman G. Rose, New York, N. Y.

St. John's Hospital, Long Island, N. Y.—Dr. Harry John Secky, Astoria, N. Y.

Bronx General Hospital, New York, N. Y.—Dr. Morris Spindel, New York, N. Y.

United States Navy — Dr. Charles B. Stringfellow, University, Va., and Dr. Emory Ewing Walter, Chattanooga, Tenn.

Barnert Hospital, Passaic, N. J.—Dr. George M. Stroll, Brooklyn, N. Y.

Garfield Hospital, Washington, D. C.—Dr. Frank E. Tappan, Berryville, Va.

U. S. Public Health Service, Washington, D. C.—Dr. Frank F. Thweatt, Jr., Petersburg, Va.

Lucas County Hospital, Toledo, Ohio.—Dr. Charles Edward Watson, Jr., Kipling, N. C.

Philadelphia Jewish Hospital, Philadelphia, Pa.—Dr. Jacob Wilkins, Richmond, Va.

Blue Ridge Sanatorium, Sanatorium, Va.—Dr. Thomas Epps Wilson, Jr., Clinton, Miss.

Cincinnati General Hospital, Cincinnati, Ohio.—Dr. John F. Woodward, Jr., Norfolk, Va.

Unity Hospital, Brooklyn, N. Y.—Dr. Max Yacht, Brooklyn, N. Y.

Instructor in Pathology, University, Va.—Dr. Joseph B. Graham, Talladega, Ala.

Dr. Walter Jackson Lackey, Fallston, N. C. and Dr. Frank Coulson Pinkerton, University, Va., were also members of the graduating class.

Our Danville Meeting.

Plans are progressing splendidly for the fifty-ninth annual meeting of the Medical Society of Virginia, to be held in Danville, October 16, 17 and 18, under the presidency of Dr. J. W. Preston, of Roanoke. In addition to the three invited guests previously named—Dr. E. Starr Judd, of Rochester, Minn.; Dr. Dean Lewis, of Baltimore, and Dr. Seale Harris, of Birmingham, Ala.—Dr. Morris Fishbein, editor of *The Journal of the American Medical Association*, has accepted an invitation to address one of our general meetings and also the House of Delegates. Dr. Fishbein will also speak before the Woman's Auxiliary. Arrangements are being made to have clinics on the first day for those who may not care to enter the golf tournament. These, together with the meeting of the House of Delegates and renewing old friendships, will furnish diversion a plenty for those who come early. All of the hotels and meeting halls are close together. While in this day of automobiles, it is impossible to secure special railroad rates on the certificate plan, for those coming by rail, round trip rates of once and a half the straight fare are sold over the Southern Railroad for distances of less than 150 miles, these good for five days.

The Woman's Auxiliary will look out for the ladies accompanying the members, so all doctors are requested to bring their wives and make this a real vacation.

The Norfolk County Medical Society,

At its meeting on June the 4th, elected the following officers for the ensuing year: President, Dr. James H. Culpepper, Norfolk (by acclamation); vice-president, Dr. C. Lydon Harrell, Norfolk; and secretary-treasurer, Dr. Lockburn B. Scott (re-elected), Norfolk. Delegates were also named to represent the Society at the Danville meeting of the Medical Society of Virginia.

Vacation Time is Here.

The season selected by most people for vacations is here and the woods and the trees and the rivers are calling every one—high and low, rich and poor. So why should not the doctor heed the call and take the vacation he recommends for his clientele?

Edgar Guest has expressed so well the need for a vacation in his verses entitled "Tired," that we take the liberty of reproducing them with the hope that our readers will heed the warning before reaching the "breaking" point:

TIRED

When the jests of your friends seem stale, and the shout of your boy torments,
You are tired, old man, and you ought to get out of your world of dollars and cents.

When censure is quick on your tongue and you rage over trifles small,
When you don't hear one-half that is said, and you don't seem yourself at all;

When you haven't an ache or a pain, yet you jump at the slightest sound.
It isn't a doctor you want to see, but it's ocean and sky and ground.

Your body is hale, but your soul is sick and cramped in its house of clay
And it wants to be freed from dollars and cents to drift with its dreams away.

Oh you may breathe in the city air, and barter your strength for a goal.
But the break will come if you pay no heed to the cry of your shackled soul.

The American Psychiatric Association,

At its annual meeting recently, held in Minneapolis, elected Dr. Samuel T. Orton, of Columbus, Ohio, president. Dr. Earl D. Bond, of Philadelphia, was elected vice-president, and Dr. Clarence O. Cheney, Poughkeepsie, N. Y., secretary. Atlanta, Ga., was selected as the 1929 place of meeting.

The 1927 Christmas Seal Sale is Virginia's Largest.

Belated returns from sales of the Christmas seals in Virginia have brought the total to $62,970.04, the largest sale Virginia has ever had from these seals. This amount passed 1926—the previous record year—by $5,619.90.

Dr. and Mrs. G. W. Young

And son, James, of Pennington Gap, Va., left early in June for an automobile trip through Texas, New Mexico, and California. While on this trip, they visited Dr. Young's mother at Albuquerque. They have just returned home.

Dr. and Mrs. E. C. Levy,

After several years in Tampa, Fla., have returned to Richmond, Va., and are located at 1652 West Grace Street. Dr. Levy re-organized the health department of Tampa and was in charge of the health work in that city until a political change was made in the government of the city, which gave the position to a local doctor.

Dr. T. Duckett Jones

Of the class of '23, University of Virginia, Department of Medicine, son of Dr. and Mrs. J. Bolling Jones, of Petersburg, Va., is returning to the States the first of September after spending the past year studying in the Cardiac Department of the University Hospital College of Medicine, under Sir Thomas Lewis. He has visited Copenhagen and several places in Germany while abroad. Dr. Jones will be located at the House of the Good Samaritan, in Boston, Mass., upon his return.

Mr. Straus Will do Private Laboratory Work.

Aubrey H. Straus, who has recently resigned as director of laboratories for the State and City Health Departments, will go into private laboratory work next September, at 613 West Grace Street, Richmond, Virginia. Mr. Straus will be consulting bacteriologist to St. Elizabeth's Hospital and expects to spend a considerable portion of his time in research work for the hospital. The work of his laboratory will be limited exclusively to bacteriology.

Besides all types of medical bacteriology Mr. Straus will do some industrial work acting as consulting bacteriologist to the Virginia Dairy, Richmond Ice Company, and other industries.

Mr. Straus has also just been appointed instructor in biology in the Richmond Extension Division of the College of William and Mary for the session beginning in September.

Dr. William C. Holt,

Of the class of '26, University of Virginia, and recently located there, has gone to Dallas, Texas, where he will be connected with the Parkland Hospital.

The Interstate Post-Graduate Medical Association of North America

Will meet in Atlanta, Ga., October the 12th-19th, for the first time in the South. Dr. George W. Crile, Cleveland, is chairman of the Program Committee, and he announces that eighty-two renowned clinicians and teachers from all sections of the United States and Canada have already accepted places on the

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program. Clinics will commence at 7 A. M. and last until 10 P. M., with two intermissions. All medical men in good standing in their county, state and national organizations are invited to attend. There is a registration fee of $5.00.

The National Tuberculosis Association

Held its annual meeting in Portland, Ore., June 20-23. This was attended by the secretaries of Tuberculosis Associations in twenty-seven states as well as by more than 350 tuberculosis workers from various sections of the United States. Miss Leslie C. Foster, executive secretary of the Virginia Tuberculosis Association, represented this state. Figures from the thirty largest cities in the country showed that the 1927 mortality from tuberculosis set a new low rate and marked a greater percentage of decline than any other recent year.

Dr. Walter L. Rathbun, of Fredonia, N. Y., was elected president of the National Association for the coming year. Dr. William F. Drewry, president of the Virginia Tuberculosis Association, was elected a member of the board of directors of the National Association.

Dr. and Mrs. H. Stuart MacLean,

Richmond, Va., left early in June for Montreal, Canada, from which place they sailed for England. After a visit to Mrs. MacLean's people in England, they will motor through Scotland before returning home.

Dr. Warren T. Vaughan,

Richmond, Va., was elected secretary of the American Association for the Study of Allergy at the meeting of that Society held in Minneapolis just prior to the meeting of the American Medical Association.

Dr. C. W. Trexler,

Of the class of '26, University of Virginia, recently located in San Diego, California, has accepted the position as surgeon on the staff of the Samuel Mahelona Hospital, in Kealia, Kauai, Hawaii.

Child Welfare in the Philippines.

In 1926 there were 329 child-welfare centers in the Philippines, fully half of which had physicians and nurses in attendance at the end of the year, while 32 others employed trained and supervised midwives. At these centers, reports the commissioner of child welfare of the Islands, examinations and advice are given to expectant mothers and to mothers with young children, while midwives are also invited to come for instruction.

Married.

Dr. Peter Boothe Pulman, Alexandria, Va., of George Washington University, class of '26, and Miss Carolyn Burgess, Reva, Va., June 23.

Dr. George Colbert Tyler, Newport News, Va., and Miss Hilda Margaret Lankford, Morattico, Va., June 20.

Dr. James Reginald Bailey, Keysville, Va., and Miss Marguerite Stephenson, Littleton, Va., June 23.

Dr. James M. Spencer and Miss Nellie Tickle, both of Roanoke, Va., June 18.

Dr. Paul Ellis Prillaman, of the class of '27, Medical College of Virginia and interne at St. Elizabeth's Hospital, Richmond, for the past year, and Miss Sally Doriot Haller, of Wytheville, Va., June 11.

Dr. George Wasko Surgent, of the class of '27, University of Virginia, Department of Medicine, and Miss Ida May Hicks, Crozet, Va., June 16. Dr. Surgent has just completed an internship at the University of Virginia Hospital and will now be located at Blue Ridge Sanatorium, Va.

Dr. John Melvin Crymes, of the class of '26, Medical College of Virginia, and Miss Ruth E. Staude, Richmond, Va., June 6. They will make their home in Lawrenceville, Va.

Dr. Raymond Evan Bailey, of the class of '27, Medical College of Virginia and for the past year at the C. & O. Hospital, Huntington, W. Va., and Miss Ellen Seay, of Richmond, June 30. They expect to make their home in Hamlin, W. Va.

Dr. Edward Newton Pleasants, also of the class of '27, Medical College of Virginia, recently at Stuart Circle Hospital, Richmond, and Miss Rose Lillian Fore, of Pamplin, Va., June 23.

Dr. John Wesley Parker, Jr., formerly of Emporia, Va., but now of Seaboard, N. C., and Miss Josephine Ballou Dixon, formerly of Winston-Salem, N. C. In Richmond, June 27. Dr. Parker is an alumnus of the Medical College of Virginia in the class of '27.

Dr. Judson Tomkies Vaughan, of Richmond, Va., and Miss Alice Louise Gordon, Ashland, Va., June 27. Dr. Vaughan is an alumnus of the Medical College of Virginia, of the class of '27.

Dr. Rufus H. Reitzel, Siler City, N. C., of this year's class, Medical College of Virginia, and interne at Memorial Hospital, Richmond,

for the coming year, and Miss Jessie James, Richmond. March 10.

Dr. Joseph Brown Graham, Talladega, Ala., of the class of '28, University of Virginia, School of Medicine, and Miss Ivy Louise Logan, Centerville, Ala., recently.

Dr. Walter Reuben Gladding, Cape Charles, Va., and Miss Dorothy Hardy Peple, Richmond, Va., June 7. Dr. Gladding graduated from Medical College of Virginia this June and will be an interne at Emergency Hospital, Washington, D. C., for the coming year.

Cuba to Have a Junior Red Cross.

Plans have been made for the organization of a Junior Red Cross society in Cuba with a chapter in every school of the island. The new organization will work for the establishment of children's libraries, playgrounds, school lunch rooms, dispensaries, health centers, vacation camps, and other activities for the welfare of children.

Let There be Light.

The annual report of the National Society for the Prevention of Blindness now being sent members shows a wonderful amount of work accomplished by that Society since its inception twenty years ago. The greatest single achievement is shown to be in the field of ophthalmia neonatorum. The frequency of this disease as a cause of blindness has diminished each year until it is now 64 per cent less than in 1908. Complete eradication of this source of blindness—once the most prolific of all causes—is said to be scientifically possible.

The report states that the Society is helping to safeguard the eyes of the next generation, by following up its work for prevention of blindness at birth with demonstrations of preschool eye tests, preschool clinics, and co-operation in the establishment of sight saving classes for the education of children with seriously defective vision. Using a recently perfected technique, it is now possible to test with some accuracy the vision of children too young to read letters on charts used for adults and, in many cases, conditions requiring immediate attention have been discovered and remedied.

Special "Sight Saving Classes" in public schools, first advocated by the Society in 1911, have been established in eighty cities in eighteen states, there now being 292 such classes. From October, 1926 to December, 1927 alone, more than 80,000 miles were traveled by members of the Society's staff over the United States, Canada and Great Britain.

Hope is expressed that research work in trachoma may soon help in solving the mystery of that disease which has been one of the greatest international sources of blindness.

Eye hazards of industrial occupations have been receiving much attention from the Society and during the past year that organization has brought the essential facts concerning eye hygiene, the prevention of accidental injury to the eyes, and the importance of good lighting before approximately 3,000,000 men and women engaged in the most hazardous industries.

On Staff of Gill Memorial E. E. & T. Hospital.

Dr. H. D. Scarney, formerly of the School of Ophthalmology of Harvard University and the Massachusetts Eye and Ear Infirmary, Boston, Mass., is now a member of the staff of the Gill Memorial Eye, Ear and Throat Hospital.

American Medical Association.

At the seventy-ninth annual session of the Association in Minneapolis, the middle of June, there was a registered attendance of 4,876 members. We regret that our own State had such a small representation, only seventeen having registered attendance. Virginia was represented in the House of Delegates by Drs. Southgate Leigh and J. W. Preston, duly appointed delegates, and Dr. Ennion G. Williams alternate for Dr. Murat Willis.

Dr. Malcolm L. Harris, Chicago, chairman of the Judicial Council of the American Medical Association, was elected President-Elect. Dr. W. S. Thayer, Baltimore, Md., is president. Portland, Ore., was selected as the 1929 place of meeting.

New Professors at University of Virginia.

Dr. Edwin P. Lehman, of Washington University, St. Louis, Mo., has been elected professor of surgery and gynecology at the University of Virginia, to succeed Dr. Stephen H. Watts who has retired from active teaching.

Dr. Sidney William Britton, of Johns Hopkins University, will become professor of physiology, succeeding Dr. Homer W. Smith, who has resigned to become professor of physiology at New York University.

Dr. J. T. N. McCastor,

Recently at Central State Hospital, Petersburg, Va., has gone to New York City, where he is assistant physician and graduate interne for outside maternity work at the John Ber-

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wind Maternity Hospital, at 125 East 103rd St.

Another Hospital for Richmond.

A number of Richmond doctors have secured a charter to erect a hospital, to be known as the Henry-Franklin Hospital, at the corner of Henry and Franklin Streets, Richmond, Va. Dr. A. L. Herring is president of the corporation and Dr. T. B. Pearman secretary. Other officers are Drs. T. B. Weatherly, J. A. Rollings and Campbell Harris. The proposed hospital is to have about seventy-five beds and all modern facilities and offices for sixteen doctors and dentists. There will also be a roof garden and sun parlors for convalescent patients and special obstetrical and children's departments. Plans have been prepared and it is expected that work will be commenced very shortly with a view to having the hospital ready for occupancy in the Fall.

Dr. Alexander McLeod,

Glen Allen, Va., is at present in U. S. Hospital, No. 60, Oteen, N. C.

Dr. W. J. Sturgis,

For some time at Franktown, Va., is now located at Nassawadox, Va.

Professor of Preventive Medicine.

Dr. Fred J. Wampler, recently director of the Accomac-Northampton County Health Unit, has been appointed professor of preventive medicine, assistant professor of medicine in charge of laboratory diagnosis, and director of the out-patient department, at the Medical College of Virginia, Richmond, the appointment taking effect July 1, 1928.

The Shrine's Work for Crippled Children.

The Imperial Council of the Shrine of North America is now operating 10 hospitals for crippled children in widely scattered sections of the country, besides 5 mobile units, with 700 beds available. During a recent fiscal year 2,574 patients were received, and 2,393 were discharged as cured or benefited, but the names of 1,700 more crippled children eligible for treatment were on the waiting list. Three more hospitals are to be built, as soon as funds are available, in Richmond, Pittsburgh, and central or western New York.

Sun Suits for Children.

The Bureau of Home Economics of the U. S. Department of Agriculture has recently issued a leaflet which gives directions for making "sun suits" for little children. These suits are made of such fabrics and patterns that the wearers may take their sun baths during their regular play time. They leave the neck, arms, and lower legs completely exposed; fancy, open-woven cotton fabrics are recommended for the waists, and a more substantial and opaque but light and loosely woven material for the panties or skirts. The leaflet can be secured from the Government Printing Office, Washington, D. C., at 5 cents per copy.

Dr. H. A. Dalton

Has moved from Galax, Va., to Hillsville, Route 4, Va.

Heads Health Authorities.

Dr. Matthias Nicoll, Jr., State Health Commissioner of New York, was elected president of the State and Provincial Health Authorities of North America at its annual meeting held in Minneapolis in June.

Diarrheal Deaths of Infants in 1927.

The Bureau of Vital Statistics reports that in 1927 there were 786 deaths in Virginia of infants under two years of age from diarrheal disease, the lowest number by far for any year since 1913 when vital statistics began to be kept in Virginia. This decline in mortality is attributed largely to the fact that mothers know better today than ever before how to care for their babies. In this connection, the Bureau urges "breast feeding" as the method par excellence for feeding of infants.

Dr. E. L. Boone,

Recently of Scottsburg, Va., has just located at Seaboard, N. C., for the practice of his profession. Dr. Boone graduated from the Medical College of Virginia in 1926.

Dr. H. C. Padgett,

Roanoke, Va., returned the latter part of June from Battle Creek Sanitarium where he left his wife and daughter for a few weeks' treatment.

A Heart Hospital for Philadelphia Children.

It is expected that the first 40-bed unit of the new Children's Heart Hospital of Philadelphia will be completed about August 15; the cornerstone was laid on May 2. The patients will come mostly from the heart clinics of the city. The hospital will finally have a 200-bed capacity, and as part of its work it plans to provide week-end rests for discharged patients who return for observation.

Pan-American Conference Health Recommendations.

The conference held at Habana in January and February by the Pan-American Union

recommended the establishment of a corps of visiting public-health nurses in every American country, and the enactment of laws providing for compulsory vacations for expectant mothers, employed in either public or private service, for 40 days before and 40 days after confinement, with payment of full salary.

Dr. W. V. Atkins,

Blackstone, Va., who has been under treatment at St. Luke's Hospital, Richmond, for injuries received in an automobile accident, about the middle of June, is reported as much better.

On Fishing Trip.

Drs. J. L. Wright and H. Grant Preston, of Harrisonburg, Va., with a party of friends, have been on a fishing trip at Cape Charles, Va.

Dr. A. M. Showalter,

Christiansburg, Va., is among the Rotarians who attended the national convention in Minneapolis, the middle of June.

Dr. Mallory S. Andrews,

Of the class of '25, University of Virginia, Department of Medicine, who has just completed a year's service as resident house surgeon at the Hospital of St. Vincent's de Paul, Norfolk, Va., has located in Medical Arts Building, that city, where he will be engaged in general practice.

Posture Training of Infants.

The Villard Center of the New York Diet Kitchen Association, encouraged by its success in the posture training of preschool children, is now conducting experiments in the posture training of infants in some of its baby-conference centers.

The Musically Gifted Child.

The April number of *Child Study*, published by the Child Study Association of America, is entirely devoted to the subject "Music and the Child." Dr. Carl E. Seashore, one of its contributors, expresses the opinion that if the serious training in music begins at 10 or 12, the gifted child can accomplish in a very short period all that would have been accomplished during the strain of five or six years of earlier training.

Dr. R. Lee Seward,

Isle of Wight, Va., has been elected a member of the Isle of Wight County School Board for a term of four years, beginning July 1, 1928.

South Boston Hospital Being Enlarged.

The South Boston, Va., Hospital, private hospital of Dr. R. H. Fuller, is undergoing extensive improvements.

This addition will more than double the present capacity for patients, and will include office rooms for the hospital staff, a new major operating room, one emergency operating room, examination rooms, X-ray and laboratory rooms. This building will be brick fire-proof, constructed on the most modern plan and equipped with the most modern equipment.

The South Boston Hospital was opened by Dr. R. H. Fuller May 1, 1927, with a twenty-one bed capacity, and in twelve months' time his work had grown so that he found it necessary to double its capacity.

Dr. James K. Hall,

Of Westbrook Sanatorium, Richmond, Va., has been appointed consultant psychiatrist to the State Department of Public Welfare. Dr. Hall will act in an advisory capacity to that department in the building up of its bureau of mental hygiene, which is now under way, with the traveling mental hygiene clinic as its base.

Dr. Joseph Coates,

Formerly of Monarat, Va., after several months of post-graduate work in New York City, is now located at Galax, Va., for the practice of his profession.

Copenhagen Promotes Breast Feeding.

Copenhagen has eight infant-welfare stations in the poorer sections of the city to promote breast feeding. Both married and unmarried mothers are admitted, but only when the babies are breast-fed or partly breast-fed. The babies are examined at the station every week or two, and the mothers are given necessary instructions. The neediest mothers receive milk and dinners for themselves and clothing for the baby, and the nurses visit the homes from time to time. Since 1908 these stations have cared for nearly 10,000 children, of whom only 2 per cent died while under care.

Attending Camp.

Major Charles M. Edwards, M. C., and Major William Robt. Weisiger, M. C., Richmond, Va., are among those attending the Medical Officers' Training Camp at the Field Medical Service School at Carlisle, Pa., for the period from July 8th through the 21st.

The Playground Theater.

Children's theaters are being established on

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the playgrounds of cities in all parts of the United States, notably in East Orange, N. J., Asheville, Oakland, and that intriguing center of filmdom—Hollywood. The March number of *The Playground* (New York), contains an interesting account of how the East Orange playground theater came into being and how it is used, and also gives lists of plays for little children and children of ten years and over.

Campaign to Sanitate Virginia in Three Years.

With virtually two-thirds of the Virginia counties reported, the campaign to effect 100 per cent sanitation has been definitely launched. It may shock some people to learn that there are in the State counties even today which have less than one per cent of the homes equipped with proper sewage disposal and safe water supplies; but the most backward county in Virginia today is above the average for all Virginia fifteen years ago, and there are today in Virginia a number of counties which can boast of sewage disposal well on the way to 100 per cent, such as Arlington, with 95 per cent reported, Roanoke with 87 per cent reported, Middlesex with 85 per cent reported and fifteen or more between 60 per cent and 80 per cent.

Before the campaign is ended, it may be predicted with reasonable certainty that a number of counties will be in the 100 per cent class and there is no reason why all the counties should not be in the 80 per cent or over class. This practically means a Virginia safe from filth-borne diseases.

Prizes are being offered to the association that secures the best work and the most improvements during this campaign in Virginia.

Preventing Chigger Bites is Better Than Curing Them.

When chiggers grow older they reform, mend their ways, and cease to be the seasonal source of annoyance and inconvenience to many victims which was characteristic of their flaming youth, according to the United States Department of Agriculture. Contrary to the popular impression, chiggers do not burrow into the skin and require extraction for relief. The chigger, minute in size though it is, is capable of injecting a considerable quantity of poisonous material into its host, and it is this poison that causes all the discomfort, the persistent itching that follows chigger bites. The chigger is entirely harmless when mature.

While destroying chiggers does not seem possible, in some areas, studies by the Bureau of Entomology indicate they can be checked in the vicinity of homes and camps by clearing away the underbrush, vines, and weeds from such areas, keeping the grass cut close, and by following these measures with applications of flowers of sulphur or very fine dusting sulphur. It appears, the bureau says, that from 5 to 10 pounds of sulphur scattered over an ordinary city lot will give a high degree of control, sometimes from a single treatment, but it is usually best to repeat the application two or three times at intervals of one to two weeks, especially when the applications are followed by rain.

Councilmen in Hopewell.

Drs. D. Lane Elder and S. B. Perry were recently elected members of the Hopewell, Va., City Council, for the term beginning September 1.

Ecuador Protects Child Life.

Ecuador's new public health law, enacted in 1927, prescribes short terms of imprisonment or fines ranging from about 20 cents to $20, or both fine and imprisonment, for mothers who decline to nurse their infants at the breast, unless a physician has certified their inability to do so. Similar penalties are prescribed for placing a child with a nurse who has not a physician's certificate of health, for failure to have a child vaccinated against smallpox within a certain time or to provide medical care for a sick child promptly if neglect results in death, and for leaving a child locked in a house alone.

New Child Labor Law for the Nation's Capital.

The new law to regulate the employment of minors in the District of Columbia, recently signed by the President, establishes a minimum age of 14 for entrance into all gainful occupations, except that, outside school hours, housework or agricultural work may be performed for the child's parent or guardian, children 12 years of age and over may sell newspapers, and children 10 years of age and over may distribute them on regular routes. For children between the age of 14 and 18 years an 8-hour day and a 48-hour week is established. The provisions of the new law re-

garding dangerous or injurious occupations and street trading and for enforcement constitute a great advance over the former law.

Dr. H. C. Grant,

Smithfield, Va., was called to Pittsburgh, Pa., early this month by the illness of his son, William.

Dr. F. M. Brooks,

Of Fairfax Station, Va., has been elected one of the Fairfax County schools trustees for a term of four years beginning July 1.

Oklahoma's New Child Health Council.

On May Day, 1928, representatives from 41 organizations in Oklahoma organized a State child-health council. Its first objective will be a campaign to see that every child in Oklahoma enters school as free from physical defects as possible.

Continuation-School Classes for an Employment Office.

The New York City Board of Education has authorizel the opening of continuation-school classes in connection with the employment office of the Young Women's Hebrew Association in Harlem. They will offer instruction in vocations to girls who are beyond school age and inadequately prepared for work, while they are waiting to obtain jobs. Similar classes for clerical workers were conducted at the association in 1921, and at several centers in the city in 1914.

The Children's Aid Society of New York.

The illustrated historical survey published by the Children's Aid Society of New York, in recognition of the seventy-fifth anniversary of its founding, reports that during that period it has placed more than 33,000 children in family homes. It is now planning to give greater attention to children of preschool age and gradually to transfer to the public schools the children attending its nine special schools. The school buildings are to be converted into club and recreation centers, and a neighborhood club and health center for colored children in Harlem is to be organized.

Associate Physiologist Wanted.

The U. S. Civil Service Commission, Washington, D. C., announces open competitive examination for Associate Physiologist, applications to be on file with the service not later than August the 8th. Full information may be obtained from the above address.

Experienced Technician

Desires position in Richmond. Trained in all routine laboratory procedure. Address "No. 127", care the VIRGINIA MEDICAL MONTHLY, Richmond, Va. (Adv.)

For Sale—

The following equipment of the late Dr. E. H. Heaton: Large Fisher cabinet—latest type machine—and galvanic battery outfit. Everything in perfect condition, having been used only one year. Will sell for half price. Address Mrs. E. H. Heaton, Leesburg, Va. (Adv.)

Obituary Record

Dr. Paulus A. Irving,

Ex-president and from 1910 to 1920, secretary of the Medical Society of Virginia, died at his home in Farmville, Va., June 11th, death being due to heart disease. Dr. Irving was seventy-one years of age and a native of Cumberland County, Virginia. He attended the Medical College of Virginia, Richmond, from which he graduated in 1879 and joined the Medical Society of Virginia that same year. He was for several terms a member of the Medical Examining Board of Virginia and professor of diseases of children at the former University College of Medicine, Richmond, in which city he made his home for a number of years. He was also for fifteen years secretary of the State Board of Health. He had held many positions of honor in the profession and was well known throughout the State. Dr. Irving was twice married and is survived by his second wife and five children.

Dr. John R. Wheat,

For many years a practicing physician of Richmond, Va., died at a local hospital in this city, June 4th, aged seventy-eight years. Dr. Wheat attended the Medical College of Virginia, Richmond, taking his diploma in medicine from that institution in 1877 and joined the Medical Society of Virginia in 1878. In later years, he had spent much time at his country home in Cumberland County, Va. His wife survives him.

Dr. Henry Clay Carson,

Of Osaka, Va., aged fifty-eight years, was instantly killed by an interstate railroad engine, Monday night, June the 18th. He was

struck by the engine on a trestle about three hundred yards from his home. It is thought that he was attempting to cross the trestle and fell and was caught between the railroad ties, as he was down on the track and not seen until the engine was on him. Dr. Carson was graduated from the College of Physicians and Surgeons of Baltimore, in 1892. He had been a member of the Medical Society of Virginia for about twenty-five years. His wife and three children survive him. Dr. Carson was buried at Big Stone Gap, Va., with Masonic rites.

Dr. Edgar B. Smoke,

Of Frederick County, Virginia, died June the 10th, at his home, near Winchester, Va. Dr. Smoke was eighty-two years of age and was graduated in medicine from the Medical College of Virginia, Richmond, in 1868. He had been a member of the Medical Society of Virginia for a number of years.

Tribute to Dr. E. E. Feild.

The Norfolk County Medical Society desires to place on record this tribute to our late confrere, Dr. Edward Everard Feild.

Edward Everard Feild was born on April 11th, 1855, at the old Wyatt homestead, "Walnut Grove," in Greenville County, Virginia, being the fifth child of George Wythe Feild and Ann Wyatt Feild. On his father's side he is descended from Theophilus Feild, who emigrated from England in the early part of the seventeenth century and settled in Dinwiddie County, Virginia, becoming one of the founders of Old Blandford Church, at Petersburg, in whose chancel he lies buried. On his mother's side Edward Everard Feild is descended from Sir Francis Wyatt, one of the early Colonial Governors of Virginia. To quote from Mr. James C. Feild: "Dr. Feild was a great lover of the sports so dear to the heart of the country boy, such as fishing and hunting; he was educated at a little log school house about five miles from his home, at which Mr. Samuel Hardy taught." At the age of twenty-three, Edward Everard Feild entered the University of Virginia, graduating with the degree of M. D., in 1879. "He began the practice of medicine at Hicksford (now Emporia)," continues Mr. Feild, "as a partner of Dr. Edmunds Mason, and then moved to Norfolk." He was actively engaged in the practice of his chosen profession in Norfolk until about four years ago, when he was forced to retire on account of his failing health. He died at St. Vincent's Hospital on May 30, 1928. He was unmarried, and is survived by one brother, two sisters, eight nephews and seven nieces.

Dr. Feild occupied a prominent position in his profession. It is indeed significant that his name appears sixth on the roster of the Norfolk County Medical Society, which was founded on June 5, 1884. He was elected president in 1888. It is also significant that Dr. Feild performed the first operation for appendicitis in Norfolk and that his essay on appendicitis was awarded a prize of $100.00 by Dr. Hunter McGuire, in 1894. At one time Dr. Feild was a member of the Board of Health of Norfolk. He was also associated with Dr. Frank Hope, as quarantine officer for this district. For many years he was surgeon to the British Vice-Consulate, and upon occasion, acting surgeon for the U. S. Public Health and Marine Hospital Service. He was, likewise, an earnest and consistent member of the staff of St. Vincent's Hospital.

In 1922 the University of Virginia conferred the Alpha Omega Alpha on him. In all things medical, Dr. Feild took a profound interest. He represented this district as Councilor to the Medical Society of Virginia from 1908 to 1912. He was a frequent contributor also to the proceedings of the societies to which he belonged, as well as to the leading medical journals; a paper on "Yellow Chills," read at the meeting of the State Medical Society in 1894 being perhaps its author's favorite. Indeed, it has been well said of him by one who knew him well, "Dr. Feild was far ahead of the time in which he practiced." (Dr. H. L. Myers.)

Dr. Feild was a loyal churchman and a consistent member of St. Paul's Episcopal Church. At one time he served on its vestry. Nor was he less zealous in the societies to which he belonged. At the time of his death he was a past master and an honorary member of the Owens Lodge of Masons. As a man and citizen he did his part well; always interested in the affairs of his friends, his city and his profession; always congenial, sympathetic and ready to serve in affliction; always liberal, chivalrous and affectionate. The world is better for the life of Edward Everard Feild.

THEREFORE BE IT RESOLVED: That the Norfolk County Medical Society and the whole profession has lost one of its most distinguished and lovable members, and that we extend to his family our deepest and most heartfelt sympathy; and furthermore be it resolved, that a page in our minutes be dedicated to his memory.

JAS. W. HUNTER,
CHAS. R. GRANDY,
E. C. S. TALIAFERRO,
Committee.

Dr. Charles C. Christian

Died at his home in Urbanna, Va., June the 7th, at the age of sixty-eight years. He was a son of the late Dr. William S. Christian. His wife and a son survive him. Dr. Christian was a member of the Mid-Tidewater Medical Society.

Dr. John Buckner Winfield,

Formerly of Clarksburg, W. Va., but more recently of Fairfax County, Va., died suddenly June the 6th, after having been in bad health for some time. Dr. Winfield studied medicine at the former University College of Medicine, Richmond, from which he graduated in 1897 and was for about twenty-five years a member of the Medical Society of Virginia. He practiced pediatrics in Clarksburg until a short time ago, when he was forced to rest on account of his health. His wife and five children survive him.